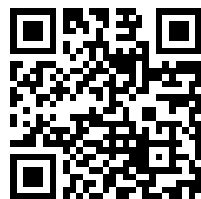


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NEW ZEALAND  
PILOT.  
1875.



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THE  
**NEW ZEALAND PILOT.**

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FROM SURVEYS MADE BY H.M. SHIPS *ACHERON* AND *PANDORA*,  
CAPTAIN J. LORT STOKES, AND COMMANDER BYRON DRURY.  
1848—55.

~~~~~  
COMPILED BY  
CAPTAIN G. H. RICHARDS AND F. J. EVANS, MASTER, R.N.

~~~~~  
*FOURTH EDITION.*

INCLUDING ALSO THE CHATHAM ISLANDS AND THE  
OFF-LYING ISLANDS SOUTHWARD OF NEW ZEALAND.

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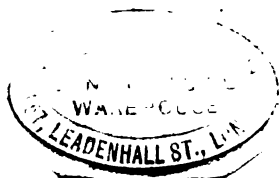
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## ADVERTISEMENT TO FOURTH EDITION.

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THE New Zealand Pilot contains Sailing Directions for the New Zealand group of islands, and has been derived from surveys made by order of the LORDS COMMISSIONERS of the Admiralty, between the years 1848 and 1855, in the *Acheron*, Captain J. LORT STOKES, and the *Pandora*, Commander BYRON DRURY.

The surveys of the *Acheron* comprised the chief part of the coasts and harbours of the Middle and South islands, along with Cook strait; and two portions of the North island; from Doubtless bay to Mercury islands, and from cape Kidnappers to cape Palliser on the east side; and from thence to New Plymouth.

Detached parts of Hauraki gulf, and the coasts from Mercury bay to cape Kidnappers on the east side, as also the west and north coasts of the North island from New Plymouth to Doubtless bay, with Pelorus sound in the Middle island, and the islets called the Snares, off the South island, were surveyed in the *Pandora*, by Commander DRURY, who drew up Sailing Directions for these portions of the coast, which were promptly rendered available to the navigator by being officially published in the New Zealand Gazette.

The various notices and directions resulting from the above surveys were compiled by Captain G. H. RICHARDS, R.N. (who furnished a large portion of original remarks) and Mr. FREDERICK J. EVANS, Master, R.N., officers engaged in the surveys of the *Acheron*.

The present edition (fourth) has been revised from Reports and Surveys made in late years by the New Zealand Government as also from documents in the Hydrographic Office; and in addition, contains a description of Chatham islands, and the off-lying islands southward of New Zealand.

F. J. E.

Hydrographic Office, Admiralty, London.  
February 1875.

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**IN THIS WORK THE BEARINGS ARE ALL MAGNETIC  
EXCEPT WHERE MARKED AS TRUE.**

**THE DISTANCES ARE EXPRESSED IN SEA MILES OF  
60 TO A DEGREE OF LATITUDE.**

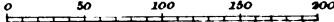
**A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO  
100 FATHOMS.**



INDEX TO  
ADMIRALTY PUBLISHED CHARTS  
ALLUDED TO IN THIS WORK.

\* indicates that a plan of the place is given upon the coast chart which is shown by the diagram to embrace it. A number against a place thus: Otago H° 2411 shows that a separate plan is published bearing that number. For details of scales, prices &c. see Admiralty Catalogue.

Scale of Sea Miles.



Cook Str. Anchorages.  
(Queen Charlotte S.°  
Croisilles H°  
Pelorus Sound  
Fort Gore  
F. Underwood  
Tory Channel

2684  
2685

Plans

Freshwater Basin  
Anita Bay  
Deas Cove  
Faoule H°  
2589 Pikerongill H°  
Duck Cove  
Anchori. H°  
North & South F.

2589

2580

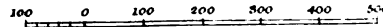
MIDDLE ISL. P.

NORTH ISL. P.

THE OFF-LYING ISLANDS

(shown on chart 2468)

Scale of Sea Miles.



# NEW ZEALAND PILOT.

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## INTRODUCTION.

THE islands of New Zealand were discovered by the Dutch navigator Abel Tasman, in the year 1642 ; he remained there but a very short time, and little was known of their character and extent until the return of Captain Cook from his first voyage in 1769 ; during this and his two subsequent voyages, he explored and partially surveyed their general outline.\*

Later navigators, both French and English, have added to our geographical knowledge of their form and position ; and since the close of the last century whalers and sealers have resorted to their harbours in order to refit their vessels, to traffic with the natives, and to procure wood and water.

The Church Missionary Society, to whose untiring zeal Great Britain is chiefly indebted for the early civilization of the natives of these islands, began its labours among them in the year 1814 ; a quarter of a century later, namely, in 1840, the three islands of New Zealand were proclaimed a British colony, under the names of New Munster, New Ulster, and New Leinster ; the seat of government being established at Auckland, in the Hauraki gulf.

As these names, however, have not come into general use, the islands will be always called in the following pages the North, the Middle, and the South, or Stewart island, the names by which they are best known among the inhabitants, and most familiar to the seaman.

They lie between the parallels of  $34\frac{1}{4}^{\circ}$  and  $47\frac{1}{2}^{\circ}$  south latitude, and the meridians of  $166\frac{1}{4}^{\circ}$  and  $178\frac{3}{4}^{\circ}$  east longitude ; the North and Middle islands are by far the largest ; they occupy nearly the same space, and are separated from each other by Cook strait ; their extent of coast line taken together amounts to nearly 3,000 miles. The area of the country is estimated at 102,000 square miles, two-thirds of which are fitted for agriculture and grazing ; the South or Stewart island is comparatively inconsiderable in extent ; it has always, however, been classed as one of the principal islands, and possibly the number and excellence of its harbours may entitle it to

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\* See Admiralty chart of New Zealand, No. 1,212, from the surveys of H.M. ships *Acheron* and *Pandora*, 1848-55 ; scale, *degree* = 2·4 inches.



this distinction, although its circumference does not exceed 120 miles; it is separated from the Middle island by Foveaux strait.

**NORTH ISLAND.\***—The geological structure is chiefly volcanic, and traces of recent volcanic action are to be seen in many parts; it is mountainous and well wooded, particularly in the northern districts; among the trees are the kauri, the red and white pine, and many others suitable for ship-building purposes; the kauri is confined to the north, and is seldom found far to the southward of the parallel of Auckland.

The sea worn or peninsulated coast features of the northern portion of this island are very remarkable, for instance, the waters of Manukau harbour, on the western side, and those of Waitemata river,—or Auckland harbour,—on the eastern, meet within a mile.

The North island embraces an extent of coast amounting to nearly 1,500 miles; its harbours cannot be said to be numerous, nor are they by any means equally distributed; by far the greater number are included between the North cape and cape Colville,—the east point of Hauraki gulf,—a distance of only 200 miles; while from cape Colville to the East cape, another distance of 200 miles, there are only the two anchorages, Mercury bay and Tauranga harbour, both difficult of access, and the former unfit for vessels of large burthen. Again, from the east cape to port Nicholson, a distance of about 350 miles, the coast offers no secure harbour, but merely occasional anchorages, with off-shore winds.

The harbours on the west coast of the North island have all shifting sand bars at their entrances.

Proceeding northward from port Nicholson, is the small bar harbour of Porirua, and also anchorages on the east side of Mana and Kapiti islands; between Kapiti and New Plymouth (*Taranaki*) are the Manawatu, Rangitiki, and Wanganui rivers, as also several smaller streams fit only for boats; they have all bars at their entrances; the three former are navigable for small vessels.

New Plymouth, 160 miles from port Nicholson, is an open roadstead exposed to winds between N.E. and W.S.W.; northward is the river Mokau, the harbours of Kawhia, Whaingaroa, and Aotea, with the Waikato river, fit only for vessels of small tonnage. The remaining and principal ports on the west coast are Manukau, Kaipara, and Hokianga; they are spacious and magnificent harbours when once inside; and with the excellent surveys that have been now made, and due caution, their bars may be passed with safety.

Such is a general summary of the harbours of the North island, and the manner in which they are distributed; a detailed description, with directions for their navigation, will be given in its proper place.

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\* Native name, *Te ahī a mawi*.

**MIDDLE ISLAND.**\*—The Middle, like the North island, is chiefly of volcanic formation, but it contains a far greater extent of plain and open country, the eastern and southern portions being to a great extent available for grazing or agricultural purposes; a range of high and rugged mountains, not inaptly termed the backbone of the island, extends from cape Farewell, the north-west extreme, through the whole length of the island to the south-west extreme, approaching occasionally within a few miles of the coast, varying in height from 3,000 to 7,000 feet, and attaining, between the parallels of 43° and 44° S., an elevation of 13,200 feet. This latter magnificent mountain has received the name of the illustrious navigator Cook, who first sailed along this part of the coast.

The observation with regard to the number and distribution of the harbours in the North island applies in like manner to those in the Middle island.

The north side from cape Farewell to cape Campbell is indented with numerous deep and extensive sounds and harbours, where excellent anchorages may be obtained with little difficulty; while along the whole of the eastern coast, from cape Campbell to the Bluff harbour, an extent of nearly 500 miles, the harbours of Akaroa and port Cooper (or port Victoria), in Banks peninsula, and Otago,—a bar harbour, though not difficult of access,—are the only ports which offer shelter to the mariner.

The harbours on the south side are, the Bluff (*Awarua*) and New river, the former available for vessels of large tonnage, though it has a narrow entrance, with strong tides; New river is navigable for vessels drawing 14 feet, but it is necessary to be acquainted with the locality to enter with safety; both these harbours are admirably situated in connexion with the extensive tracts of grazing country, which extend from them nearly 100 miles inland:—the ports of Stewart island are also exceedingly convenient and safe, should bad weather prevent a vessel entering the Bluff harbour or New river.

From the south-west extreme to Milford haven on the west coast, a distance of 120 miles, nature has been most bountiful but capricious in her provision of harbours, there being no less than thirteen deep inlets or sounds, some running inland a distance of 20 miles; they are, however, more picturesque than useful, surrounded by high and precipitous mountains, rising almost perpendicularly from the water's edge to an elevation of from 3,000 to 5,000 feet, and clothed nearly to their summits with impenetrable forests; their depths generally exceed a hundred fathoms, and anchorage can rarely be obtained except at the very head of some remote cove, where the water often shoals suddenly from 50 to 5 fathoms.

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\* Native name, *Te wai pounamu*.

The appearance of this iron-bound coast, cleft assunder as it were into harbours by some awful convulsion of nature, presents a scene truly grand and solitary;—no inhabitants but the tenants of the forest, the *ka-ka-po*\* and *kiwi*†, rare and remarkable birds known in no other country; and no single spot of level land. The mariner has little inducement to seek an anchorage here, unless it be the whaler who would take refuge from the coming gale when he has not sufficient room to keep the sea, or the sealer in the legitimate pursuit of his calling.

Fifty miles northward of Milford haven is Jackson bay, where there is anchorage with off-shore winds; there is some cultivation here, and whalers occasionally touch for the sake of the precarious refreshments which the few and scattered natives are able to supply.

From Jackson bay to cape Farewell, a distance of 300 miles, is an open and exposed coast, except the small inlet of Wanganui, a bar harbour, 10 miles to the south-west of the latter cape, and eligible for vessels of 10 or 12 feet draught in fine weather; to which may be added Buller river, Grey river, Teremakau river, Hokitika, Okarito, Bruce bay, Taumaka, and Martins bay, places that have come into notice as outlets for the traffic caused by the goldfields, and the large tracts of grazing country in their neighbourhood.

**SOUTH, or STEWART ISLAND,**‡ as has been observed, is small in extent, being only 120 miles in circumference; it is mountainous and well wooded, has several excellent harbours on its eastern side, as well as some anchorages on its western; but from the prevailing westerly winds there is always a swell on that side, and the latter should only be considered as stopping places.

This island is the resort of many whaling vessels, colonial and foreign; wood and water can be procured with little trouble, and refreshments, such as they require, obtained from the settlers. It is becoming of considerable importance from its proximity to the extensive grazing country of the southern districts of the Middle island, in consequence of the scarcity of good anchorages on that part of the coast.

Although it does not come within the scope of a work of this kind to enter into the political or statistical details of a country, the hydrography and navigation of which alone it professes to describe, yet a few brief remarks on the different settlements of a colony comparatively so little known as New Zealand may possibly prove useful to the seaman, and not be considered irrelevant.

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\* *Nestor*, a remarkable genus of nocturnal parrot, of which but two species are known, one of these (*N. hypopolius*) is restricted to New Zealand, the other (*N. productus*) to Philip island, a mere rock near Norfolk island, but now considered to be extinct.

† *Apteryx*.—This genus comprises three known species, all restricted to New Zealand.

‡ Native name, *Rakiura*.

**NEW ZEALAND** is divided into nine provinces, viz., Auckland, Taranaki, Hawke bay, and Wellington (the capital) in the North island; Nelson, Marlborough, Canterbury, with Westland, Otago, and Southland in the Middle island. There are 21 ports where resident magistrates and customs officers are established, viz., Auckland, Akaroa, Chatham island, Dunedin, Greymouth, Havelock, Hokitika, Invercargill, Lyttelton, Napier, Nelson, New Plymouth, Okarito, Onehunga, Tauranga, Timaru, Wellington, Westport, Wanganui, Whangarei.\* The government of the whole colony is vested in a governor appointed by the crown; and a general assembly, consisting of two houses, one elected by the people, the other appointed by the crown for life. Each of the provinces has a local government, consisting of a superintendent and provincial council; the islands were created into a diocese in 1841.†

The commerce of New Zealand increased more than twenty fold in the twenty years from 1852 to 1871. The imports, which were of the value of 359,444*l.* in 1852, amounted to 4,078,193*l.* in 1871; and the exports, valued at 145,972*l.* in 1852, amounted to 5,282,084*l.* in 1871.

The staple article of export to the United Kingdom is wool, the value of which amounted to 1,205,072*l.* in 1866, and in 1871 to 1,986,996*l.* The British imports comprise mainly textile fabrics and iron, the latter of the value of 134,013*l.* in 1871.

Shipbuilding and the trade in timber are, next to wool growing, the chief elements of the industry of New Zealand.

Among the mineral productions are gold, copper, iron, and coal.

**AUCKLAND.**—The town of Auckland stands on the narrow neck of land which separates the eastern from the western coasts, being built on the south bank of the Waitemata river, an arm of the Hauraki gulf, and one of the most secure harbours in New Zealand; its position in a commercial point of view appears to be most favourable, having water communication from both sides of the island—on the eastern, by the Hauraki gulf, and on the western by the harbour of Manukau, the waters of which flow within half a mile of an arm of the Hauraki gulf, two miles eastward of Auckland harbour. The amount of agricultural land in the neighbourhood is also considerable; and the natural facilities for inland communication when developed are great; thus to the north, the Kaipara and Waioira rivers lead through the kauri districts almost to the Bay of Islands—and to the south, the Waikato and Thames rivers into the heart of the island.

This province contains within itself almost all those natural productions which determine the particular industries of nations, and which are usually

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\* From New Zealand Almanac, 1874.

† In addition to the Metropolitan, there were in 1864 the four sees of Christchurch, Nelson, Wellington, and Waiapu. The total population of New Zealand on the 1st March, 1874, was 299,861.

only found in widely distant countries, as timber, coal, limestone, gold, copper, iron, silver, chrome, lead, antimony, zinc, cadmium, plumbago, soap, stone, mica, asbestos, sulphur, alum, and other minerals, many medicinal springs, and a mild healthy climate. Gold has been found on both sides of the range running from Cape Colville to the Aroha mountains, distant about 100 miles. Gold has also been found at North Cape, Bay of Islands, Wairoa, near Howick, at Manukau near Drury, at Rangiriri, and other places. Copper at Coromandel, Kawau, at Great Barrier Island, in Upper Waikato, &c. Lead at Coromandel and on Great Barrier Island. Tin at Shortland and in Taupo district. Arsenic at Coromandel and on Great Barrier Island. Manganese at Waiheke and Pakihi. Iron on the west coast. Mercury and antimony have been found at Shortland, and quicksilver at the Bay of Islands. Coal, timber, flax, gum, and fish.

The freehold holdings of land in Auckland province amounted in 1871 to 850,363 acres, leasehold, 586,474 acres, Crown lands rented for pastoral purposes, 97,922 acres.

In 1870 there belonged to the port of Auckland 184 vessels, of 9,177 tonnage.

Auckland, established in 1840, has made rapid progress; it is now a commercial town of importance, presenting an aspect of comfort and substantial prosperity, and is the emporium of the bulk of the trade with the natives; the coasting trade also is of considerable extent. The number of European inhabitants in the town and province, by the census return of December 1861, was 24,420; by that of 1871 it had increased to 62,335, the population of the town of Auckland being 12,937. The area of the town is 631 acres. The principal streets, all lighted with gas, are built with continuous ranges of fine buildings. The manufacturing industries are numerous, such as ship and boat building, engineering, and iron foundries, the manufacture of glass, rope, twine, tiles, earthenware, doors, sashes, leather, pickles, sauces, jams, ale, whiskey, baskets, biscuits, blacking, bricks, soap, candles, carriages, carts, pottery, &c.\*

**TARAWAKI**, formerly known as New Plymouth (which latter name, by an act of the colonial legislature, was retained for the town only), is one of the earliest settlements, and was colonized in 1841 by emigrants principally from the counties of Devon and Cornwall; it is situated on the west coast of the north island, 14 miles northward of the noble Mount Egmont, and although the smallest, is considered the most fertile district in New Zealand. It is essentially an agricultural settlement, and all kinds of produce flourish in the greatest luxuriance; corn is grown to a large extent, ground by water mills, and exported principally to Wellington

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\* From New Zealand Almanac, 1874.

and the other settlements. The drawback to the advance of Taranaki is the want of a harbour; the roadstead, however, is safe in moderate weather, and with the establishment of large boats, organized under the direction of a beach-master, vessels load and discharge cargoes with facility and rapidity. The construction of a breakwater has lately been proposed. The climate of Taranaki is generally considered to be one of the finest in New Zealand. The native disturbances of 1860-61, and again in 1863, have seriously interrupted the progress of the settlers in this province, and until peaceful relations have been restored, its prosperity will be retarded. By the census return of December 1861 the number of the European inhabitants in New Plymouth and the districts was 2,044; while that of 1871 shows 4,480.

Freehold holdings in Taranaki province amounted in 1871 to 57,587 acres; leasehold, 20,732 acres; crown land rented for pastoral purposes, 361 acres.

**HAWKE BAY.**—This province, originally forming part of Wellington, and known also by the native name of Ahuriri, was erected into a separate province on the 1st November 1858. It is situated between Auckland and Wellington on the east coast, and has an extensive tract of country. In size, compactness of form, climate, and centrality of position between the two great provinces of Auckland and Wellington, Hawke bay bears a general resemblance to Taranaki. A large proportion of the country is composed of land of great natural fertility, well suited for agricultural and pastoral purposes; it has a small harbour (port Napier), the town of which is the capital of the province. The European population in 1861 numbered 2,611; in 1871, 6,059, of which 2,179 were inhabitants of port Napier.

Freehold holdings in Hawke bay province amounted in 1871 to 833,460 acres; leasehold, 402,557 acres; crown land, rented for pastoral purposes, 570,753 acres. In 1870 the number of vessels belonging to port Napier was 9 of 501 tonnage.

**WELLINGTON**, founded in 1839 by the New Zealand company, was the first regular settlement; occupying the central position it does on the north shores of Cook strait, with an excellent and spacious harbour (port Nicholson), within easy distance of the southern settlements, and adjoining extensive pastoral and agricultural districts; it possesses great advantages, is the commercial depôt of a wide extent of country, and now the seat of government.

In the number and tonnage of the shipping which visit its port, Wellington may vie with Auckland, and it likewise enjoys a large and increasing coasting trade; the European population in the province, from the census return of December 1861, was 12,566; by that of 1871 it

was 24,001, of which 7,908 comprised the population of the town of Wellington.

The southern provinces, and Wellington in particular, appear to be subject to severe and not unfrequent shocks of earthquakes; the first experienced by the colonists occurred in October 1848, and caused much damage to the more substantial buildings in Wellington; the last, in January 1855, though equally if not more severe in character, was not attended with so much destruction of property; happily there was but a very small loss of life on either occasion.\*

Freehold holdings in the province of Wellington amounted in 1871 to 822,692 acres, leasehold 330,108 acres; crown land rented for pastoral purposes 123,879 acres.

The number of vessels belonging to the port of Wellington in 1870 was 26, of 3,285 tonnage.

**NELSON**, also originally a New Zealand Company's settlement, was established in 1841, at the head of Blind bay. It has more an agricultural and pastoral character than either Auckland or Wellington, and though not possessing the advantage of a spacious port, its haven affords secure anchorage to vessels of large tonnage.

The Waimea plain, in the immediate vicinity of Nelson, affords about 50,000 acres of level land, a greater portion of which is adapted for agricultural purposes. Collingwood, a rising township, is placed in Massacre bay, and has been constituted a port of Entry; it is near the gold fields of Aorere.

The climate of Nelson is superior probably to any other portion of New Zealand, being singularly free from the strong winds, otherwise so common. Shocks of earthquakes have been experienced, but more subdued in character than those felt on the opposite side of Cook strait. The population of the town and surrounding districts was, by the census return of December 1861, 9,952; that of 1871 gave 22,501, 5,534 being for the town of Nelson.

Freehold holdings in Nelson province amounted in 1871 to 640,218 acres, leasehold 159,350 acres, and crown land holdings 384,021 acres.

The shipping belonging to the port of Nelson amounted to a tonnage of 4,062, numbering 61 vessels.

**MARLBOROUGH**, formerly a portion of Nelson, is a tract of country on the north-east coast of the Middle island; it comprises the valley of the Wairau. This district contains about 250,000 acres of land suitable for agricultural and grazing purposes, and is now fully occupied for the depasturage of extensive flocks; the Wairau river, which runs through this valley and

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\* Whether these earthquakes cause any change in the hydrographic features of the localities of greatest action, future surveys can alone determine; the shoal flat in Lambton harbour, fronting the town of Wellington, rose 2 feet in the earthquake of 1855.

discharges itself into Cloudy bay, offers facilities for the shipment of wool and other produce from the plains ; it is navigable for several miles for large cargo boats, and is in close proximity to the excellent harbour, port Underwood ; the capital of the province is Picton, placed on one of the deep arms of Queen Charlotte's sound, the natural outlet of the inland district. By the census return of December 1861, the European inhabitants numbered 2,299, by that of 1871, 5,235, out of which the town of Picton numbered 636, that of Blenheim 741.

In the province of Marlborough the holdings amounted in 1871 to freehold 645,364 acres, leasehold 68,415 acres, rented crown land for pastoral purposes 904,225 acres.

**CANTERBURY** was organized on special church principles, the first body of colonists arrived in 1860. The agents of the Colonizing Association were employed for some time previously in surveying the country, and in the construction of roads, wharfs, and accommodation ; from these circumstances, and the fact of several thousand emigrants having been landed almost at the same time on the field of their labours, together with the natural advantages of its position, as also other causes, gave it almost immediately a comparative position with the earliest of the settlements, and cannot fail to make it hereafter an important province in New Zealand.

The site of the principal town, Christchurch, with a population of 1,500 (1862), is on the plain a few miles from the sea coast, immediately northwards of Banks peninsula.

This great plain, extending westerly half way across the island, and bordering on the grazing lands of the Nelson and Marlborough provinces to the north, and on those of Otago to the south, contains upwards of 2,000,000 acres of grass country a large proportion of it being considered excellent agricultural land. It has several considerable streams running through it, discharging their waters into Pegasus bay, and by the Ninety miles beach : closely adjoining Banks peninsula is the Avon or Opawaha river on a branch of which Christchurch is built ; it is navigable for large cargo boats, but the bar, near Summer is at times difficult to attempt.

The area of land under cultivation, and in use for grazing purposes, in 1871, in the province of Canterbury amounted to 5,662,375 acres ; of this 557,185 acres were freehold, there were also 364,418 acres leased for other purposes.

Lyttleton, the sea port town of Canterbury (with a population of 2,551) is built on the north shore of port Victoria,\* on the north-west side of Banks peninsular ; this port is easy of access to vessels of any burden, and notwithstanding its being partly open to the eastward, and subject

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\* Formerly known as port Cooper or Cooper bay.



to an occasional swell, it is considered a fairly good anchorage.\* The port of Lyttleton owned in 1870, 61 vessels, of 4,062 tonnage. The only access hitherto between Lyttleton and the capital (Christchurch), from which it is distant about nine miles, for goods, has been by coasters and small steamers up the river Avon, which enters the sea a few miles to the north of port Victoria heads; there is a road over the hills, but only available for light traffic; a connecting railway (the first in New Zealand) carried through the lofty hills over the port by a tunnel, is now in active progress; when this great work is completed it will afford every facility for the transport of country produce to the shipping port, and supplies therefrom to the interior. In 1862 the first electric telegraph in New Zealand was opened between Christchurch and Lyttleton. The population of the plains, including the few settlers scattered over Banks peninsula, in 1857, was 6,712, and by the census return of December 1861, 16,040, while the return of 1871 showed 64,158 including Westland, of this number the population of Christchurch was 12,446.

**OTAGO** province includes a large section of the southern part of the Middle island, 150 miles southward of Banks peninsula, was founded in 1847 by a body of Scotch colonists in connection with the free church. The port, though it has a bar entrance, is generally accessible, and good when inside; the climate is bracing and healthy, and the grazing and agricultural capabilities of the adjoining country are highly spoken of. The discovery of gold in 1861 in various localities has, by the great influx of population, rapidly developed the resources of this province, which, in addition to its gold fields, is said to be rich in other minerals. The chief town, Dunedin, is at the head of a sheet of water extending eleven miles from the entrance of the harbour, in a south-westerly direction: ships of large burden proceed six miles up to Koputai bay, off the small port town, Chalmers, between which and Dunedin there is constant communication. Since the discovery of gold, Dunedin has greatly increased in population and resources.

The extent of cultivated and grazing land in the province of Otago, in 1871, was 6,099,921 acres, rented from the Crown; freehold 729,427 acres; leasehold, including crown land, 301,362 acres.

The shipping of the port of Dunedin consisted, in 1870, of 71 vessels, of 8,184 tonnage.

Otago province numbered 4,631 settlers in 1857, and by the census return of December 1861, the population was 27,163, and now far exceeds these numbers, having amounted in 1871 to 60,722, of which Dunedin numbered 14,857, and port Chalmers 1,406.

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\* A breakwater is now constructed which affords shelter for small vessels.

The following table shows the quantities and value of gold exported from the several provinces containing gold fields, from 1st April 1857, to end of December 1870, and also to the end of December 1871.

Gold Fields of	Exports previous to December 31st 1870.		Total Exports from April 1st, 1857, to December 31st, 1871.	
	Quantity.	Value.	Quantity.	Value.
	Oz.	£	Oz.	£
Province Auckland -	299,023	1,005,238	629,349	2,198,946
„ Marlborough -	86,682	141,580	88,549	148,998
„ Wellington -	30	120	30	120
County Westland -	1,476,453	5,812,187	1,609,865	6,843,835
Prov. Nelson -	1,016,520	4,018,404	1,126,504	4,458,840
„ Otago -	2,684,755	10,471,744	2,889,695	11,091,514
„ Southland -	29,386	116,246	29,386	116,246
Total -	5,542,849	21,565,479	6,272,878	24,352,999

**SOUTHLAND.**—This recently created province, formerly part of Otago, is at the extreme south end of the Middle island, and extends from the Mataura river on the east, to the Waiau river on the west, its northern boundary stretching nearly to the gold fields adjoining lake Wakatip; it has some fine plains. Invercargill, the capital, is placed on New river, and has already made good progress; it is the outlet of an extensive pastoral district; the port of discharge for large vessels is at Bluff harbour, about 15 miles to the southward; the population by census return of 1871 was 8,769.

The extent of land comprised under the head of freehold holdings in Southland in 1871 was 500,576 acres; leasehold, 73,350 acres; crown land rented for pastoral purposes, 1,437,188 acres.

In 1870 the port of Invercargill owned 7 vessels of 189 tonnage.

**NATIVES.**—With regard to the native population of New Zealand it is not easy to arrive at an exact calculation of their numbers, as no complete census has yet been taken, 1864.\* From various estimates made by those best qualified to judge, and who expended much trouble to arrive at the truth, it appears that in the year 1850 their number did not exceed 70,000. Of these, about 67,000 occupied the North island, a large proportion being distributed over the northern part, and between the bay of Plenty and Poverty bay on the east coast. In the Middle island the

\* By official returns it appears that, at the beginning of 1868, there were in the North island 37,107, in the Middle island 1,433, or a total of 38,540 Maories in the whole colony. According to accounts the Maories are declining in numbers from year to year; by returns between the years 1858 and 1868 there was a decrease of 30 per cent. of the total native population. The census of 1872 gave a total of 36,359.

proportion was very small, being not more than 2,600, and those greatly dispersed.

In 1840 the native population was estimated at 120,000, thus making a decrease of 4 per cent. per annum for the ten years. This decrease agrees with the calculations that were made on a small scale in and about Wellington from 1847 to 1850. The character of this interesting race is undergoing great change. Cook's account is invaluable as a record of their habits and manners as a heathen nation. They are now becoming a Christian people, with a keen appreciation of the benefits resulting from the arts of peace; they have generally learned to read and write, to cultivate wheat and European fruits, and to sedulously attend places of divine worship and schools; indeed, at the present time European customs, clothes, houses, and food are being adopted by them not only near the settlements, but through the islands.

The following is an account of the number of emigrants sent from England by the Agent General of Emigration for three months, ending 31st December 1873: Wellington 971 souls; Auckland, 387; Otago, 1157; Canterbury, 1312; Hawke bay, 491.

**shipping.**—The numbers and tonnage of vessels entered inwards and cleared outwards at the several ports of New Zealand during the year 1870 were as follows:—The total inwards was 756 vessels, of 273,151 tonnage, being a decrease, as compared with 1869, of 8 in the number of vessels, but an increase of 22,420 in tonnage. The total outwards was 766 vessels, of 265,407 tonnage, being a decrease, as compared with 1869, of 5 in the number of vessels, but an increase of 7,643 in tonnage.

Of the 756 vessels inwards, 145, of 85,643 tonnage, were British; 553, of 167,869 tonnage, colonial; 45, of 15,361 tonnage, American; 4, of 569 tonnage, German; 3, of 427 tonnage, French; 2, of 1,025 tonnage, Norwegian; one, of 1,000 tonnage, Russian; one, of 536 tonnage, Swedish; one, of 385 tonnage, Hawaiian; and one, of 336 tonnage, Dutch. Of the 766 vessels outwards, 133, of 78,197 tonnage, were British; 574, of 166,812 tonnage, colonial; 44, of 15,115 tonnage, American; 5, of 2,228 tonnage, Norwegian; 3, of 568 tonnage, German; 3, of 427 tonnage, French; 2, of 673 tonnage, Dutch; one, of 1,000 tonnage, Russian; and one, of 387 tonnage, Hawaiian.

The number and tonnage of vessels entered inwards during the year 1873 were as follows: 888 vessels, with a tonnage of 303,741, being an increase, as compared with 1870, of 132 vessels with 30,590 tonnage.

**Imports.**—The total value of imports at the several ports in 1872 was as follows: Auckland, 1,190,008*l.*; Thames, 29,264*l.*; Russell, 1,059*l.*; Manganui, 370*l.*; Hokianga, 2,049*l.*; New Plymouth, 17,605*l.*; Wanganui, 39,679*l.*; Wellington, 476,886*l.*; Napier, 104,056*l.*; Wairau, 7,897*l.*;

Picton, 3,898*l.*; Kaikoura, 65*l.*; Nelson, 254,375*l.*; Westport, 94,900*l.*; Greymouth, 193,606*l.*; Hokitika, 154,453*l.*; Okarito, 2,732*l.*; Lyttelton, 629,457*l.*; Akarva, 180*l.*; Timaru, 41,782*l.*; Oamaru, 19,065*l.*; Dunedin, 1,756,046*l.*; Invercargill, and Bluff, 107,720*l.*; Riverton, 15,787*l.*; total, 5,142,921*l.*

**Exports.**—Auckland, 740,234*l.*; Thames, 1,376*l.*; Russell, 6,349*l.*; Manganui, 474*l.*; Hokianga, 6,878*l.*; Kaipara, 708*l.*; New Plymouth, 689*l.*; Whanganui, 28,541*l.*; Wellington, 328,306*l.*; Napier, 243,064*l.*; Wairau, 80,088*l.*; Picton, 6,720*l.*; Nelson, 65,642*l.*; Westport, 139,201*l.*; Greymouth, 275,193*l.*; Hokitika, 230,135*l.*; Okarito, 11,617*l.*; Lyttelton, 829,260*l.*; Timaru, 29,165*l.*; Oamaru, 14,783*l.*; Dunedin, 1,843,679*l.*; Invercargill and Bluff, 224,340*l.*; Riverton, 34,223*l.*; total, 5,190,665*l.*

The number of telegraph stations in the colony in December 1870 was 63, being 15 more than in 1868; the number of miles of lines in 1870 was 1,887, being 1,761 more than in 1866; the aggregate number of telegrams (private and Government,) was 238,195, against 48,231 in 1866. According to the annual report, July 1873, there were transmitted 568,960 telegrams, being 157,193 more than in the previous year, or 330,765 more than in 1870; the length of line maintained was 2,314 miles (or 427 more than in 1870) at a cost of 9,479*l.*

#### GENERAL SIGNALS FOR ALL NEW ZEALAND PORTS.

From and after the 1st day of September 1868, the following *general signals* are to be used at all New Zealand ports, and any person failing to use the proper signal when required, or showing wrong or unauthorised signals shall, in addition to any liabilities which he may incur in so doing, be liable to a penalty not exceeding 50*l.* But nothing herein contained shall prevent the use, in cases not provided for in these regulations, of private or local signals, in addition to the general signals herein prescribed, if such local or private signals shall have been previously authorised in writing by the colonial marine engineer.

#### TIDAL SIGNALS.

Flood tide. Two balls vertical at masthead, not less than six feet apart.

Last quarter flood. Three balls vertical at masthead, with not less than six feet between each.

Ebb tide. One ball at masthead.

#### BAR OR DANGER SIGNALS.

Bar signals will be distinguished by their being arranged *horizontally*.

Wait for high water. A ball at each yard arm, and one on mast half the length of the yard below the yard.

Stand on, take the bar. Four balls horizontal on the yard, two on each side the mast.

Bar dangerous. Three balls horizontal on yard, two on any one side of mast, and one on the other.

Put to sea. Two balls horizontal on yard, on either side the mast.

*Note.*—Semaphore arms are to be used for piloting vessels over all bars where a pilot establishment is maintained, when pilots are not put on board, and the vessel being piloted is to be steered in the direction towards which the semaphore arm is pointed. When the semaphore arm is dropped, the vessel is to be kept steady as she goes.

*Manukau harbour having several channels, special regulations have been issued by the local authorities for the guidance of vessels frequenting that port; and strangers are cautioned against attempting to enter without a knowledge of these local regulations.*

Signals to be made from vessels entering or in harbour as required :—

Exempt from pilotage. White flag at the main.

Pilot required. Union jack at the fore.

Steam tug required. Telegraph flag at the peak.

Mails on board. Commercial telegraph flag at the main.

Health or boarding officer wanted. No. 8 of commercial code at the main.

Gunpowder on board. Ensign at the mizen.

Medical assistance wanted. Union jack over ensign at the peak.

Custom boat wanted. Union jack at the peak.

Clearing officer wanted. White flag at the fore.

Police wanted (by day). Ensign at the main.

Police wanted (by night). Two white lights vertical at the peak, or at the same height where they can be best seen, four feet apart.

In addition to the above, every pilot station is to be provided with a set of the commercial code of signal flags, which will be used as required.

#### NIGHT SIGNALS FOR OPEN ROADSTEADS, &c.

##### From Shore.

A boat will come off. Two white lights, vertical (as to a steamer coming in).

Boat cannot put off. Two lights vertical, upper *red*, lower white.

Wait till daylight, boat will put off then, weather permitting. Two lights vertical, upper white, lower *red*.

Keep to sea—put to sea. Two white lights, horizontal, with a red light between them, to be used for vessels approaching or at anchor.

##### From Vessels.

Will wait till daylight. Two lights vertical, upper white, lower *red*.

Cannot wait. Two lights vertical, upper *red*, lower white.

Cannot keep to sea—put to sea. Two white lights, horizontal, with a green light between them.

## CHAPTER I.

FROM THREE KINGS ISLANDS TO HAURAKI GULF, INCLUDING  
AUCKLAND HARBOUR AND ITS APPROACHES.\*

## VARIATION IN 1875.

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Three Kings islands - 13° 30' E. | Auckland harbour - 14° 10' E.

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VESSELS from the westward, and bound for Auckland harbour, or any of the ports on the east side of the North island, should sight the Three Kings, a cluster of islands lying 38 miles W.N.W. of cape Maria Van Diemen, which forms the north-west point of the North island of New Zealand. The group extends 7 miles in an E.N.E. direction; the islets are of considerable height,—Great island 995 feet,—and may be seen at a distance of 20 miles.

The tides and races between these islands run from 3 to 5 knots, and frequently have the appearance of shoal water. H.M.S. *Pandora* sounded the different channels and found no dangers that were not visible:—the only detached danger is a rock a little above water, which lies east of the Great King, about three-quarters of a mile.

Vessels may pass on either side of these islands; but it is recommended they should be passed on the north side at a distance of two leagues, as by so doing the strong currents in their immediate vicinity are avoided, as also tide races which exist between them and the land. They are uninhabited, and the landing is dangerous and uncertain at all times.

Leaving the Three Kings islands, a course should be steered to pass North cape (*Otou*), at about the same distance, although, if desired, it may be approached within one mile.

**NORTH CAPE** bears from the north King island E.  $\frac{3}{4}$  S. 47 miles. It is a steep flat-topped cliff 740 feet high, sloping for three miles to the north-west, and on a nearer approach it exhibits a reddish appearance. Off the pitch of the cape, but connected by a ledge of rock, is a peaked islet; and for one-third of a mile N.E. by E. of the islet is foul ground, with a rock at its extremity only uncovered at low water.

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\* See Admiralty charts of New Zealand coasts, sheets Nos. 1 and 2, Nos. 1,212 and 2,543; scale,  $m=0.3$ . Captains Stokes and Drury, R.N., 1849-55.

**CAPE BRETT.**—Being abreast of the North cape, distant two leagues from it, an E. by S.  $\frac{3}{4}$  S.\* course should lead 10 miles outside cape Brett, the easternmost cape of the Bay of Islands, a remarkable bold quoin-shaped headland 1,200 feet high, with a high round hummock on its extreme point. It bears E.S.E. from the North cape, and is 78 miles distant. † A high steep islet (Piercy islet), perforated with a hole or archway, lies N.E. by N. from the cape, nearly half a mile distant. Cape Brett may be seen in clear weather from 25 to 30 miles.

**POOR KNIGHTS.**—On rounding cape Brett, the Poor Knights islands (*Tauiti Rahi*) will be seen; they are two rugged looking islands, about 200 feet high, lying close together, and extending in a north and south direction  $2\frac{1}{2}$  miles; their north end bears from cape Brett S.E. by E.  $\frac{1}{2}$  E. 26 miles, and their distance from the nearest point of the main is 11 miles.

**Directions.**—Steer for these islands, passing on either side: the water is deep,—64 fathoms,—and there are no dangers. Three miles S.  $\frac{1}{2}$  E. of their southern extreme are three steep cone-shaped islets, and a fourth of the same character, S.  $\frac{1}{2}$  W.  $4\frac{1}{2}$  miles; these islets can be seen at a distance of 10 or 12 miles; should the Poor Knights be passed on the outside at a distance of 2 miles, a vessel, when abreast of them, should steer S.S.E., which is a direct course into the Hauraki gulf, and leads between the Moro Tiri isles, and the Moko Hinou and Fanal islands, 4 miles from the former and 8 from the latter.

**MORO TIRI ISLANDS, or HEN AND CHICKENS,** are a group of four islands (with some islets off their western end), lying in an E.N.E. and W.S.W. direction, and 5 miles in extent. They bear from the southern Poor Knight S. by E. 23 miles; from Bream head, the western Chicken bears E. by S. distant 5 miles; the group is clear of dangers.

**BREAM HEAD** (*Tewara*) is a remarkable cape, 1,500 feet in height, very rugged and craggy, and its summit resembling the head of an animal, having two nipples or ears on it; it is the north head of Wangari bay and harbour, and bears from the southernmost Poor Knight S.  $\frac{3}{4}$  W.  $22\frac{1}{2}$  miles. See page 58.

**MOKO-HINOU and FANAL ISLANDS.**—These islands are 15 miles to the eastward of the Moro Tiri islands. The Moko-Hinou are the northernmost, and consist of three islands, about 250 feet high; the two principal islands lie close together, and are each nearly one mile in extent, in a north-east and south-west direction: they bear from the southernmost Poor

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\* For nine months out of the twelve, a vessel will find herself off the Poor Knights at daylight, from the offset from the coast; therefore, if the weather permits and the coast is visible, the course should be regulated accordingly.—Captain Drury's Remarks.

† See page 51.

Knight S.E.  $\frac{1}{3}$  E. 29 miles, and from the east Chicken E.  $\frac{3}{4}$  N.  $14\frac{3}{4}$  miles. W. by N. one and three quarter miles from the south-westernmost island, is a smaller one, lying north-west and south-east, nearly half a mile in length ; there are no dangers about these islands but what are visible.

Fanal island is E. by S.  $\frac{1}{2}$  S. 2 miles distant from the south-west Moko-Hinou ; it is a little more than half a mile in length, and N. by E. of it, three-quarters of a mile distant, lies a long reef, half a mile in extent east and west, and always above water. Navire rock lies S. by W.  $\frac{3}{4}$  W., three-quarters of a mile from the south-west point of Fanal, and the Simpson rock S.  $\frac{1}{2}$  W.  $2\frac{3}{4}$  miles. These two rocks are well out of the water, and the latter may be seen at 3 miles distance.

**TARANGA ISLAND**, (the Hen,) of the Chicken group, lies  $2\frac{1}{2}$  miles to the southward of the Chickens ; it is  $2\frac{1}{2}$  miles in length from east to west and one mile from north to south, and has a high and remarkable double peak on its western end, somewhat resembling Bream head. Two miles to the southward of the west end of Taranga island, is Totourou, or the Sail rock, a steep islet resembling from many points of view a fore and aft schooner. Between Sail rock and Bream tail lies the McGregor rock, for description, see page 63.

**Directions.**—Having passed the Hen and Chickens, the same course S.S.E. leads between Rodney point and Little Barrier island, nearly in mid-channel, and 3 miles eastward of the Flat rock. Vessels entering the Hauraki gulf from the northward should pass always inside or to the westward of Little Barrier island.

**LITTLE BARRIER ISLAND** (*Houtourou*) is a very remarkable island, 4 miles in length from north to south, and  $3\frac{1}{4}$  from east to west, steep, and almost inaccessible ; it rises 2,400 feet above the sea, and has on its summit several distinct peaks of nearly the same elevation ; hence it has received the name of mount Manypeaks ; a low and remarkable stone boulder point, steep close-to, forms the south-west extreme.

**RODNEY POINT**, which may be considered as the western entrance point of the Hauraki gulf, is bold and cliffy, and has no dangers off it ; it is backed by mount Hamilton, a remarkable wooded hill 1,300 feet high, with two round summits, bearing W.S.W. 6 miles from the point.

**HAURAKI GULF.**—The principal entrance to the Hauraki gulf is between Rodney point and Little Barrier island, a breadth of 11 miles clear of danger. Between the Little and Great Barrier islands (the latter an island of considerable extent, and high) is a passage of 8 miles in width. The Horn rock lies nearly midway between them, and is the only danger,—it bears from the south-east end of the Little Barrier E. by S.  $\frac{1}{2}$  S. 4 miles, and breaks when there is any swell.



**TAKATAU POINT** is S.E.  $\frac{3}{4}$  S. 6 miles from Rodney point, and has several conical rocks standing on its extremity; it is the north point of an extensive bight, which will be treated of in describing the coast and harbours hereafter.

**KAWAU ISLAND** is nearly 2 miles south of Takatou point; it is 4 miles in length and about the same in breadth; and until the channel between it and Takatau point is opened out, the island will appear like the continuation of the main land. See page 64.

**FLAT ROCK** is 2 miles to the eastward of the south-east point of Kawau island; it is 4 feet out of the water, resembling in size and appearance the hull of a large boat, and can be seen plainly at a distance of 4 miles from a vessel's deck; it is steep to, and may be passed on either side. Its bearings and distances are as follows:—

- From the south-east point of Kawau island - E. by N.  $\frac{1}{2}$  N. 2 miles.
- „ Takatau point - - - - - S.E.  $5\frac{1}{2}$  miles.
- „ South-west extreme of Little Barrier island - - - - - S. by W.  $14\frac{1}{2}$  miles.
- „ North-west extreme of Tiri Tiri island - N.  $\frac{1}{4}$  E. 9 miles.

**Beacon.**—Flat rock is marked by a *black* beacon with a cage surmounted by a diamond.

**TIRI TIRI ISLAND** is one and a half miles long in a north-west and south-east direction, and bears S. by E. from the south-east end of Kawau  $8\frac{1}{2}$  miles.

**LIGHT.**—The iron lighthouse, 48 feet high, painted *red*, on the south-east point of Tiri Tiri island, is 300 feet above high water; it exhibits a *fixed* white light, of the second order that in clear weather is visible 23 miles.

**SHEARER ROCK** with only 2 feet on it at low water, and steep to, lies from the east point of Tiri Tiri island E. by N. nearly one mile distant.

**Buoy.**—A *red* buoy marks the position of the Shearer rock, but as it is moored in 14 fathoms water, it is liable to be washed away; vessels from this circumstance have struck on the rock: from the buoy, the lighthouse bears W.S.W., distant about one mile; the north extreme of Tiri Tiri island W. by N.  $\frac{3}{8}$  N., and its south extreme S.W.  $\frac{5}{8}$  W.

**Directions.**—After passing Kawau island, the passage to Auckland may either be made eastward of Tiri Tiri island, or through the Wangaproa passage to the westward of that island, between it and the Wangaproa peninsula; if the former course be adopted, Tiri Tiri island should not be passed on its eastern or outer side within 2 miles to avoid the Shearer rock.

**WANGAPROA PASSAGE.**—Should this passage be taken, it will be found perfectly safe and easy, having a clear working width of  $1\frac{1}{2}$  miles, with from 9 to 15 fathoms depth of water. There is a rock nearly awash

at low water, 3 cables W. by S. from the north-west point of Tiri Tiri island, and some rocky ledges extend for a cable off the points of Wangapoa peninsula; the shores therefore should not be approached too near on either side; there is also a reef awash 2 cables off the south side of Tiri Tiri island, but this does not interfere with the navigation of either passage (see p. 71).

From a berth 2 miles eastward of the Shearer rock,  $10\frac{1}{2}$  miles on a S.S.W. course, or from the centre of the Wangapoa passage, the same distance on a S.  $\frac{1}{4}$  E. course, will take a vessel into the Rangitoto channel, which latter is  $1\frac{1}{4}$  miles wide, and when in it, the mid-channel course is S.E.  $2\frac{1}{2}$  miles to abreast the North head of Auckland harbour. From Tiri Tiri island and generally from some miles to the northward of it, Rangitoto, and the adjacent islands eastward, will be plainly seen.

**RANGITOTO ISLAND** cannot fail to be immediately recognized; it is circular in shape, about  $3\frac{1}{2}$  miles in diameter, and rises gradually to a height of 920 feet, with a crater-like summit, on which are clearly to be distinguished at a distance of 7 or 8 miles, three nipples, and has this peculiar feature, that, taken from every point of view, it presents the same appearance; it is almost bare of vegetation, the summit being composed entirely of masses of scoria; it is connected with Motu Tapu, the island next to the eastward, by a sandy beach of a quarter of a mile long, dry at low water.

**Dangers.**—Several rocky ledges extend off the western shores of Rangitoto island, which latter should not be approached in consequence within 3 cables, and the opposite shore on nearing Auckland should also be approached with caution, as an outlying sunken rock, with only one foot on it at low water, lies half a mile NW. by N. from Takapuna head, the first point of land northward of the north head of Auckland harbour, and distant from it three-quarters of a mile. A *black* cask buoy has been placed on the north side of this sunken rock, which is steep-to, having 3 fathoms close on all sides. From the rock the flagstaff on mount Victoria bears S.  $\frac{1}{4}$  E.; buoy on Rough rock, S.E. by E.  $\frac{3}{4}$  E.; Rangitoto peak, N.E.  $\frac{1}{2}$  E.

**AUCKLAND HARBOUR.**\*—The north head of this harbour and mount Victoria, half a mile farther to the westward, are two remarkable round hills, easily distinguished at a distance of two or three leagues. Mount Victoria is 280 feet high, and has a signal and pilot station on its summit. For New Zealand general harbour signals, see page 13.†

\* See Admiralty plan, No. 1,970; scale,  $m = 4\cdot3$  inches, by Captains J. L. Stokes and Byron Drury, R.N., 1848–55.

† See Admiralty plan of entrances to Auckland harbour, No. 1,896; scale,  $m = 1\cdot0$  inch, corrected to 1874, by Captains Stokes and Drury, R.N.

**Rough Rock**, on the western side of Rangitoto channel, with 8 feet at low water, lies N. by E. three-quarters of a mile from the north head of Auckland harbour, and has a buoy chequered *red* and *white* on its shoal part; it may be passed on either side, but to the eastward is preferable.

A rocky patch, about one-third of a cable in extent, having only 8 feet on it at low water springs, with  $2\frac{1}{2}$  and 3 fathoms on its edges, lies between Takapona head, and Rough rock.

**Buoys.**—A *red* buoy has been placed on the east side of the patch in  $2\frac{1}{2}$  fathoms at low water springs, with Takapona head bearing W.S.W.,  $2\frac{3}{4}$  cables, Rough Rock east  $3\frac{1}{4}$  cables, and the extreme of North head S. by E.  $\frac{1}{2}$  E.  $6\frac{1}{2}$  cables.

In consequence of another sand bank having grown up to the southward of Rough rock, about half a cable long, with only 12 feet water on it, at low water spring tides, a striped *red* and *black* buoy has been placed on its south-eastern edge, in 3 fathoms at low water. This buoy is distant  $2\frac{1}{2}$  cables S.S.E.  $\frac{1}{4}$  E. from Rough rock buoy, and from it mount Eden is just open of North head S.S.W.  $\frac{1}{4}$  W.; and Takapona head bears W. by N.  $\frac{1}{2}$  N. distant  $7\frac{1}{4}$  cables.

**Caution.**—Masters of vessels in entering Auckland harbour, are cautioned not to approach too near the western shore of Rangitoto channel, as rocky ledges and foul ground extend from two to three cables from the shore. Neither is it prudent for large vessels to take the channel in-shore (westward) of the Rough rock, although it is now well marked by the addition of the buoys above mentioned.

Vessels passing in-shore of Rough rock should not approach the buoy within one cable, as foul ground extends for some distance around the rock.

**The NORTH HEAD** should not be approached nearer than a quarter of a mile, as a sandy spit extends off it. On opening out the town of Auckland, which stands on the south shore of the harbour, two miles from the entrance, the water deepens to 8 and 9 fathoms, and the channel, which lies in a W. by S. direction, maintains an average breadth of three-quarters of a mile.

**Buoy.**—A *red* buoy is placed in 2 fathoms on the end of a spit which extends off Dépôt point on the north shore, three-quarters of a mile above the north head; a white storehouse is built on this point; Britomart point S.W. by W.  $\frac{1}{4}$  W. will clear this spit, and lead up the harbour.

**Caution.**—The south shore of the harbour is flat, and mud flats and rocky patches dry at some distance off; this shore should not be approached within a third of a mile; or in beating up, tack at the first shoal cast.

**Bean Rocks, LIGHT.**—Bean rocks which uncover at low water, bear E. by S. from North head nearly one mile distant, on which, at an elevation of 50 feet above high water, a *fixed* light is exhibited that in clear weather should be seen from a distance of about 10 miles; the *red*, white, and *green* colours are respectively seen as follows:

*Red.*—Between the bearings W.  $\frac{1}{2}$  S. and S.W. by W.  $\frac{3}{4}$  W. in Tehmaki strait, and on south side of Koreho channel, including the reef north of Koreho island.

*White.*—Between the bearings of S.W. by W.  $\frac{3}{4}$  W. and S.W.  $\frac{1}{4}$  W. in the fairway of Koreho channel, and the south-east side of Hieh channel.

*Green.*—Between the bearings S.W.  $\frac{1}{2}$  W. and S.S.E.  $\frac{1}{2}$  E. on the north-west of Koreho and Hieh channels, including the east side of Rangitoto channel and the Rangitoto reef.

*White.*—Between the bearings S.S.E.  $\frac{1}{2}$  E. and S.E.  $\frac{3}{4}$  S. in the fairway of Rangitoto channel.

*Red.*—Between the bearings S.E.  $\frac{3}{4}$  S. and E. by N.  $\frac{3}{4}$  N. on the west side of Rangitoto channel, including Rough rock and the north shore of the harbour, with the Sandspit-buoy and Dépôt point.

*White.*—Between the bearings E. by N.  $\frac{3}{4}$  N. and N.E.  $\frac{1}{2}$  E. in the fairway of the harbour.

In-shore the light is eclipsed between the bearings N.E.  $\frac{1}{2}$  E. round by north to W.  $\frac{1}{2}$  S.

**Directions.**—Vessels entering Auckland harbour at night by the north or Rangitoto channel, should make the white or fairway light, steering in on this line of light until the summit of the North head bears S.W.; then keep away south across the *red* into the white (harbour) fairway light, bringing the three white lights (in a triangle) on Queen Street wharf to bear S.W. by W.  $\frac{3}{4}$  W., which will lead up the harbour to the usual anchorage ground below the wharf. These lights appear as one at 3 miles distance, and are not easily distinguished from the lights of the town point.

Vessels having to work in should not enter on the *green* light when near Rangitoto reef, that is, when the peak of Rangitoto bears E.  $\frac{1}{4}$  N.; nor on the *red* when the summit of mount Victoria bears S.W.  $\frac{1}{4}$  W., as they will on this latter bearing be in the vicinity of the Rough rock; they must also keep well in the white light when passing the Sandspit buoy and Dépôt point.

Vessels entering by the Tehmaki strait will see the *red* light over the low southern part of Koreho island, and taking care not to approach within one mile of the island, pass through the *red* into the white fairway light of Koreho channel; then steer so as to pass about two cables N.W. of the lighthouse, crossing the coloured lights of the Rangitoto channel, into the white harbour fairway light, and for the anchorage as before described.

Vessels entering by the Hieh channel will keep on the line (S.W.  $\frac{1}{4}$  W.) intersecting the *green* and white lights, edging away into the white in passing the north-west extreme of Hieh island, and thence up the Koreho channel and into the harbour as before described.

**Beacon.**—The beacon that formerly stood on the Bean rocks is now erected on the north-east extreme of Bastion reef, and from it the lighthouse bears N.W., distant 3 cables.

**Anchorage.**—Merchant shipping are generally berthed by the pilot opposite Commercial bay;—men-of-war should berth east of Britomart point, bringing Stanley and Onepolo points in one, and Britomart point S.W.  $\frac{1}{2}$  W. in 5 to 6 fathoms mud.\*

Opposite the town the harbour has a depth of from 7 to 9 fathoms breadth across, a mile and a half, and 6 miles farther up the harbour there is a depth of 4 fathoms. The commercial wharf forming a continuation of Queen Street (the principal thoroughfare of the town) is more than 1,500 feet long, where the largest merchant vessels and the San Francisco, Honolulu, Australian, and New Zealand mail steamers may lie alongside in deep water.†

**Tides.**—It is high water full and change in Auckland harbour at 7h. 5m.; springs rise 11 feet, neaps 9 feet. The velocity at springs seldom exceeds 2 knots.

**The WAITEMATA RIVER** continues its westerly direction 3 miles from the town of Auckland, and is navigable for ships of large tonnage; one arm then branches off to the northward towards the Kaipara river, and another to the southward towards Manukau harbour: the northern arm has a deep but narrow channel, and is navigable for  $2\frac{1}{2}$  miles, or as far as Herald island; the passage leading to Manukau is available only for large boats, and its head is separated from the waters of that harbour by a portage of about  $1\frac{1}{2}$  miles.

**Outside anchorage.**—Should it be necessary to wait for daylight or any other cause, to enter Auckland harbour, anchorage with southerly or westerly winds may be obtained in the bight north of Wangaproua peninsula, in from 12 to 16 fathoms, or if advanced to the southward of that peninsula, anywhere between it and Rangitoto island, in from 8 to 10 fathoms. When sufficiently far south to be protected by the islands of Rangitoto, Motu Tapu, &c., safe anchorage in 6 and 7 fathoms may be had in almost any weather; and strangers are recommended to adopt this course rather than

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\* Men-of-war, and ships with powder, anchor to the eastward of a line from Britomart point to the flagstaff on mount Victoria. Remark Book of C. H. Vernon, Captain H.M.S. *Iris*, 1860.

† Ships' compasses may be adjusted at Auckland; the charges are, for vessels under 50 tons, 3*l.* 3*s.*; 50 tons to 100, 4*l.* 4*s.*; 100 tons to 300, 5*l.* 5*s.*; 300 tons to 500, 6*l.* 6*s.*; over 500, 7*l.* 7*s.*

attempt to enter the harbour at night, unless the light on Bean rocks, or the Rangitoto shore and the North head of Auckland are plainly made out.

**From AUCKLAND to the N.E.\***—Vessels bound to the northward from Auckland will find the Rangitoto channel the safest and easiest, as well as the most direct, and the directions already given will be found sufficient. This channel is also recommended to vessels bound to the eastward and intending to pass out of the Hauraki gulf between the Great Barrier island and cape Colville, for this reason, that after passing Rangitoto island, one course N.N.E.  $\frac{3}{4}$  E., leads clear of everything, and direct for that passage, passing to the westward of the islands of Otatou at a distance of 2 miles, and thereby avoiding the David rocks, an extensive cluster occupying a space of 2 miles, and lying one mile to the eastward of the easternmost Otatou island, and likewise the D'Urville† rocks, which are 3 miles to the eastward of the David rocks.

From the westernmost Otatou island to cape Colville is N.E.  $\frac{1}{4}$  N. 22 miles; and from a berth 2 miles off that island, 24 miles on a N.N.E.  $\frac{3}{4}$  E. course will carry a vessel abreast, and to the northward of Channel islet (*Takaupo*), a high steep rock lying N.N.W., 3 miles from cape Colville. After passing the Channel islet, which may be done on either side, though to the northward is preferable, as there is frequently a heavy swell setting on cape Colville, a ship bound to the southward should edge away E.  $\frac{1}{2}$  S., passing between Cuvier\* island and the D'Haussez\* group.

The passage between cape Colville and the south end of the Great Barrier island is  $7\frac{3}{4}$  miles in width in its narrowest part.

**KOREHO and HIEH CHANNELS** are to the northward of Auckland, and the former, which leads into the Hieh and Waiheke channels, lies between Rangitoto island and the mainland. With a north-west wind which blows directly through the Rangitoto passage, it may be sometimes convenient to pass to sea through the Hieh channel, which lies between the island of the same name and that of Motu Tapu; it is three-quarters of a mile in width, and has from 8 to 15 fathoms depth of water.

**Directions.**—Leaving Auckland harbour and passing between its North head and the Bean rocks, when in mid-channel between the two, steer N.N.E., or for the peak of Rangitoto island for about half a mile, or until the marks are on for clearing a shoal of 9 feet,—at low water—which lies in the centre of the Koreho channel: these marks are, the flag-staff on mount Victoria in a line with the south end of the white sandy beach immediately to the northward of the north head of Auckland. Keeping these marks on, will carry a vessel to the southward of the shoal in 3 fathoms at low water: this shoal, which is chiefly mud, is 2 cables in extent; from it, the central peak of Rangitoto island bears North one and eight

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\* Names given by Dumont d'Urville, who visited a portion of this coast in 1827.

tenths miles; North head of Auckland, S.W. by W.  $\frac{1}{4}$  W. 2 miles; Bean rock lighthouse S.W. by S. one and four tenths miles.

When the peak of Rangitoto island bears N.N.W., a course may be steered N.E.  $\frac{1}{2}$  E. for Hieh channel, passing the small island Koreho at the distance of little more than half a mile. On the port hand, about 3 cables from the Rangitoto shore, is a patch of 5 feet, with a *red and white* buoy on it.

**Beacon.**—There is a beacon on the northern extreme of the reef, off the eastern end of Koreho island. The reef extends from the eastern end of the black sandy bay, two cables to the beacon, from thence south-east about three cables. To the westward of the beacon the ground is clear, with one to  $1\frac{1}{2}$  fathoms low water spring tides. The beacon dries at low water; from it the east end of Koreho is on with east part of Tehmaki head, S.S.E.; west extreme of Koreho island is on with mount Edeu, S.W.  $\frac{1}{2}$  W.; south end of Hieh island, bears E. by N.  $\frac{1}{2}$  N.

**Directions.**—In passing through the Hieh channel, neither the north-west head of Hieh island nor the south-east point of Motu Tapu should be approached within 2 cables as there are some rocks lying off both.

When Hieh island is passed, the channel between Motu Tapu and Waiheki island increases to a width of two miles, with deep water all over, and a N.E. by N. course for 7 miles will take a vessel mid-channel between David and D'Urville rocks, at a distance of  $1\frac{1}{2}$  miles from either; (David rocks are well above water. D'Urville rocks are covered at high water 3 feet). There are no other dangers between, and they may be passed much closer if necessary; when clear of them, haul up N.N.E., or with a north-west wind as high as a vessel will lie for cape Colville passage.

**TEHMAKI STRAIT and WAIHEKI CHANNEL.**—The latter channel, which lies between the islands Waiheki and Ponoui, is convenient for vessels bound to Coromandel harbour, or the river Thames from Auckland; and small vessels working up for Auckland from the eastward will have the advantage of smooth water and anchorage in the Tehmaki strait by using it.

From the north head of Auckland harbour, through the Koreho channel and Tehmaki strait to the Passage rock in the western entrance of the Waiheki channel, is  $15\frac{1}{4}$  miles. Tehmaki strait, which is formed by Waiheki island on the north and the mainland on the south side, has excellent anchorage in every part, in from 4 to 6 fathoms, muddy bottom; the only deviation from these uniform soundings is a shell bank, nearly in mid-channel, with 3 fathoms at low water, bearing from the north point of Clarke island (*Motu Karaka*) N.E.  $\frac{1}{2}$  E.  $3\frac{1}{4}$  miles, and from Maraitai point on the mainland N. by W.  $1\frac{1}{4}$  miles.

After having cleared the 9-foot shoal in Koreho passage as before

directed, and passed the island of Koreho on its north side at half a mile distance, keep to the southward of Hieh island, and when about the same distance from it steer E.  $\frac{1}{4}$  N. for the Passage rock, which will then be 9 miles distant.

**PASSAGE and SUNDAY ROCKS.**—The former is 40 feet high, and may be passed close on either side; in a direct line between it and the northern or outer extreme of Ponoui head, nearly  $1\frac{1}{4}$  miles from each, lies the Sunday rock, with 8 feet at low water; it bears from the south point of Waiheki, E. by N.  $\frac{3}{4}$  N. nine-tenths of a mile; and from Thames point, (west point of Ponoui,) N. by W.  $\frac{1}{4}$  W. three-quarters of a mile:—There are 9 and 10 fathoms in the channel on either side of Sunday rock.

**Directions.**—If Passage rock is passed on the north side, the shore of Waiheki island should be kept on board within 2 cables for  $1\frac{1}{2}$  miles after passing it, (keeping Ponoui head on the starboard bow,) until the bay south of Finger point is opened out, a vessel will then be well clear of Sunday rock.

If Passage rock is passed on the south side, a course should be steered for the point next south of Ponoui head for  $1\frac{1}{2}$  miles, or until Thames point bears S. by W.  $\frac{1}{2}$  W.; the channel then becomes three-quarters of a mile wide, with from 6 to 12 fathoms water in it. Ponoui head should not be approached within a cable, as some rocks lie off it.

Between Kauri point—the north-east point of Waiheki island—and the island of Ponoui, lie the small islands of Pakatoa and Rotara in a north and south direction, and forming a continuation of the eastern side of the channel; to the northward of the former, and between it and Waiheki, is a fair channel out, which is a little more than half a mile in width, and with a depth of 9 fathoms. The north point of Pakatoa has a reef of rocks extending nearly 2 cables off it to the northward.

**SINGLE ROCK**, (above water,) in the channel, lies little more than half a mile S.W. by W. from the south point of Pakatoa, and has deep water close to; it is three-quarters of a mile from the Waiheki shore; and in a line midway between it and the same point is also a sunken rock, but vessels have no occasion to pass to the eastward of Single rock; coasters sometimes take the channel— $1\frac{1}{2}$  cables wide—between Pakatoa and Rotaro. There is also a channel south of the latter island of the same width; and if used, the round south head of the island should be kept pretty close on board:—W.  $\frac{3}{4}$  S. of this head, half a mile distant, is a cluster of rocks awash, a cable in extent; vessels taking this narrow channel should pass to the southward of them.

**Water.**—**OPOPO BAY**, at the east end of Waiheki island, is a favourite watering place; a vessel may anchor as near as convenient to the stream.

**TERAKINI ISLET.**—In passing out of the Waiheki channel, this bare



rocky islet will be seen,  $1\frac{1}{2}$  miles eastward from Pakatoa; there are no dangers near; it is generally covered with cormorants.

\* When clear of the Waiheki channel and abreast Terakihi, a N.  $\frac{3}{4}$  W. course 23 miles will take a vessel to the westward of Channel islet, (*Takaupo*) and into the channel between cape Colville and the Great Barrier island.

**Tides.**—On the eastern coast of the North island the flood stream runs to the northward, and the ebb to the southward, at the rate of about one knot; but in the Harauki gulf they take a contrary direction, the flood running south and the ebb north. The body of the flood stream, entering from the southward between cape Barrier and cape Colville, separates about False head on the west side of the Great Barrier island, and sweeps round to the southward, filling the Thames and Waitemata rivers through the different channels leading to Auckland. The ebb tide runs from 1, to  $1\frac{1}{2}$  knots to the south-east between Great Barrier island and cape Colville. The range of tide in the Harauki gulf is from 4 to 10 feet.

In the Wangaproa channel the tides run from 1 to 2 knots; in Waiheki strait half a knot, but from 2 to 3 knots in the adjoining narrow channels.

The preceding directions will, it is hoped, be found sufficient, with the Admiralty coast charts and plans, to guide the mariner from the Three Kings islands to the harbour of Auckland, and to sea again by the different channels. It is proposed now to offer a particular description of the north and north-east coast of the North island, and the intermediate ports.

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\* A light has been placed on the sandspit, between Pahiki and Ponui islands, according to a letter from Commander Edwin, 1872, but no farther information thereon has been received.

## CHAPTER II.

## THE COAST FROM CAPE MARIA VAN DIEMEN TO CAPE BRETT, BAY OF ISLANDS—FROM CAPE BRETT TO AUCKLAND HARBOUR—THE FRITH OF THAMES.

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VARIATION IN 1875.		
Cape Brett	14° 0' E.	Cape Colville 14° 10' E.

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## FROM CAPE MARIA VAN DIEMEN TO CAPE BRETT.

THE portion of the North island between cape Maria Van Diemen and the North cape, a distance of 22 miles in an E. by N. and W. by S. direction, has no place of shelter along its coast, which is nearly straight, the hills rising almost immediately from the sea to a height of from 700 to 1,000 feet. Although no positive dangers are known of this coast besides those which will be described, yet there seems no inducement for vessels to approach very near it, the more particularly as strong tides and currents are known to exist; vessels passing from the east side of the island to the west, and the contrary, are consequently recommended to give this north coast a berth of 4 or 5 miles: at this distance off shore soundings will be found in 30 or 40 fathoms, increasing in depth as we proceed eastward: a whirlpool is reported to have been seen in this neighbourhood, but it was not met with by H.M.S. *Pandora*, during her examination of the coast.

**CAPE MARIA VAN DIEMEN** is the north-west extreme of the North island; it is a projection from a sandy isthmus, is 420 feet high, and appears like an island from seaward: immediately north-west of it is a double islet about a mile in circumference, but with no channel between.

**PANDORA BANK** lies 6 miles from cape Maria Van Diemen, its centre bearing from it is S.S.W.  $\frac{1}{4}$  W. Five fathoms is the least water found on this hard sand-bank, but the sea generally breaks on it. Immediately seaward is 20 fathoms, deepening rapidly to the westward, and 15 fathoms between the bank and the cape.

**CAPE REINGA** lies N. by E. 4 miles from cape Maria Van Diemen, and off it extends for 2 miles to the westward the Columbia reef, constantly breaking. Coasting vessels occasionally pass within this reef.

From cape Reinga to Hooper point is E. by N. 10 miles; the coast for the first 6 miles is steep and cliffy, with hills rising to 800 or 900 feet

above the sea, terminating in a sandy beach called the Spirits bay, Hooper point forming the eastern extreme; this is a cliffy point, with a rocky islet lying close off it, the land immediately over being 1,000 feet high.

**TOM BOWLINE BAY** lies 6 miles farther eastward; it is the northern beach of the sandy neck which connects the North cape with the main land; whalers have found a temporary anchorage here, but it is very open and exposed.

**NORTH CAPE**, which is bold cliffy table land, trends E.S.E.  $2\frac{1}{2}$  miles from one mile north-east of Tom Bowline bay, and terminates in a peak of 790 feet high; a small peaked islet lies off its eastern extreme, connected with it by a ledge of rocks: foul ground extends N.E. by E. from the islet one-third of a mile, with a rock only uncovered at low water at the extreme; this northern extreme of the island is a peninsula, connected with the southern portion by a sandy neck 30 miles long, and about 6 miles wide; a range of white sand hills, from 100 to 300 feet high, extends nearly along its whole length.

The bays within the North cape offer anchorage in 5 to 12 fathoms, in moderate westerly winds, but the back swell rounding the North cape would render them bad anchorages in strong breezes.

**PARENGA RENGA HARBOUR.**—From North cape islet the coast trends south 6 miles to Kohau, or Coal point, the outer north point of Parenga-renga harbour; and which bears N.E. from the inner north point of the river. Its southern point (Fox) is sandy and backed by low sand hills.

Parenga-renga is a bar harbour, and has a shoal sandy spit extending from either entrance point; the northern spit runs from Coal point south-easterly for one mile, with 9 feet water on it; the southern spit extends from Fox point in an E. by N. direction, and has less than one fathom. The channel lies between these spits, and is nearly a quarter of a mile in width, with 15 feet at low water, which deepens to 5 fathoms as soon as the bar is passed; this bar generally breaks, and until buoyed the deep water will be best seen from aloft.

**Directions.**—The best directions that can be given for entering, are, to bring the outer extreme of Coal point to bear N.W., and at a little more than one mile distant from it, when the depth will be 10 fathoms; when—being guided as well from aloft—a vessel should steer West, or for the inner north entrance point, until a low sandy point on the south side of the river,  $1\frac{1}{2}$  miles inside Fox point, is in line with Koti Kau, bearing W.S.W.

**Anchorage.**—Koti Kau is a cliffy point 20 feet high, nearly one mile beyond the low sandy point; this course will lead to an anchorage in 7 or

8 fathoms,  $1\frac{1}{4}$  miles inside the entrance, close to Otehi point on the north shore; from this point the harbour branches into three creeks, the southernmost of which is the deepest.

**Tides.**—It is high water in Parenga-renga harbour, full and change at 7h. 54m., rise 7 feet.

**GREAT EXHIBITION BAY** is a straight sandy beach running S.S.E., nearly 11 miles from the south point of Parenga-renga, and terminating in a cliffy point named Paxton; the soundings off this part of the coast are regular in from 12 to 16 fathoms sandy bottom at one and 2 miles off shore.

From Paxton point to Granville point the coast trends S.E. by E., 7 miles; immediately to the north of the latter point is Henderson bay, a sandy beach 2 miles in extent; off this point also are two small islands—Simmond's islands—bearing North, a half mile and one mile distant from it.

Granville point may be considered as the western point of the extensive bay of Rangaounou, which lies between it and cape Kara Kara, the north-west extreme of Doubtless bay.

South of Granville point is a sandy bay, one mile in extent, where anchorage may be had with off-shore winds in 9 fathoms, but preferable shelter is to be found in Ohora bay, a mile to the southward. Mount Camel, an isolated hill, which rises 820 feet above the sea, lies immediately over the southern side of Ohora bay; between these two bays are two rocks awash, lying a quarter of a mile from the steep cliffy shore.

**OHORA BAY** is clear of dangers, and a snug good anchorage, where a vessel may ride out any westerly gale varying from north to south, in 7 to 5 fathoms.

**Water.**—Fresh water may be obtained, and abundance of fish.

**Anchorage.**—If on reaching the neighbourhood of the North cape from the southward, a vessel should meet with a north-west gale; instead of contending against it she should at once proceed to Ohora bay. Mount Camel, the remarkable isolated hill just mentioned, is an excellent guide, being the only eminence of that height on the coast for many miles.

**OHORA RIVER.**—South-westward, nearly one mile from Ohora bay, is the river of the same name, which on the approach of a north-east gale might be entered by vessels not drawing more than 15 feet water; to enter it the high land on the north shore must be kept on board within half a cable, on the west course, until a small round islet, Motu Otuna,  $1\frac{1}{4}$  miles inside the entrance, is seen just opening to the left of Tokoroa islet, and bearing W.N.W., which is the course in; vessels should moor

well over on the north shore, soon after passing the south sandy point, with the summit of the mountain bearing N.W.

**Caution.**—The channel in is rendered very narrow by a sand spit, which runs half a mile south-eastward from the southern point; the space for anchorage is small, and the tides run rapidly; the Ohora river should therefore be only run for under favourable circumstances, or on the approach of bad weather.

From Ohora river a strait sandy beach, backed by low sand hills, trends E. by S. 7 miles, and terminates in the western sandy entrance point of Rangaounou or Awanui river; but as this river is better entered from the eastward, directions for approaching from cape Kara Kara, the eastern point of the bay, will be given.

**CAPE KARA KARA** is the north-west extreme of Doubtless bay, and the eastern point of Rangaounou bay; westward of it the Moturoa islets extend for 3 miles, with several rocks among them; deep channels exist through these islets, and between them and the main, but there are also sunken rocks in these channels, on which the sea only breaks occasionally; they should not therefore be attempted by strangers, nor indeed by any vessels but coasters.

South-west of cape Kara Kara is the sandy bay of the same name, 4 miles in extent, with 10 and 12 fathoms water across; on its south-western point is a flat-topped hill, Puheki, 300 feet high, which is a good guide to Rangaounou, or Awanui river, being  $2\frac{1}{4}$  miles eastward of its eastern head.

**RANGAOUNOU BAY** extends 12 miles from east to west, and is 6 miles in depth; across its entrance there is from 20 to 25 fathoms water, and 10 fathoms within one mile of the shore; the river Rangaounou or Awanui lies in the depth of it.

The eastern head of this river, Blackney point, has some rocks above water, stretching half a mile to the north-west of it—Motu Tara—and one, two-thirds of a cable off it, awash. This head bears from the outer Moturoa islet (which latter may be rounded close,) S. by W.  $\frac{1}{4}$  W.,  $6\frac{1}{2}$  miles.

South of Blackney point, little more than a mile, is Te Kotia-tia point, the inner east entrance point of the river; it has a flat-topped hill upon it; rocky patches with 6 and 9 feet water extend off this point in all directions for one-third of a mile, and constitute the chief impediments to entering the anchorage; when a buoy is placed on the extremity of this shoal water, the entrance will be found easy.

From the western sandy point of the river, a sand spit extends for 2 miles in a N. by W. direction, having 12 feet on it; the outer point of this spit bears west from Te Kotia-tia point three-quarters of a mile,

having 15 feet on it at low water, and with a channel between the two, of 7 fathoms.

**Directions.**—Vessels entering Rangaounou river should pass two cables outside Motu Tara rocks, for there is a sunken rock outside those seen dry; then steer S. by W.  $\frac{1}{2}$  W., (shoaling from 7 to  $3\frac{1}{2}$  fathoms) until about two-thirds across the entrance, or until Te Kotia-tia point bears E.  $\frac{1}{2}$  S., when immediately haul up S.E. by E.  $\frac{1}{2}$  E., and pass fully half a mile from it.

**Anchorage.**—When Te Kotia-tia shuts in Blackney point, anchor in 5 to 7 fathoms, half a mile above the point; half a mile above this anchorage, the flats and narrow channels commence; coasters may go 4 miles up.

**Tides.**—It is high water full and change in Rangaounou or Awanui river at 7h. 44m., rise 7 feet.

**MATAI BAY.**—South-east of cape Kara Kara, 5 miles distant, is Knuckle point, the western entrance point of Doubtless bay. Matai bay is midway between the two, and is divided by a narrow peninsula into two inner bays, Ohunga-hunga, and Waikate: the western, Ohunga-hunga, has the best anchorage, in 5 fathoms sand bottom; the eastern, Waikate, is full of rocks; in it is the native village of Orurua, where fresh water and supplies may be obtained; the hills rising behind this village are remarkably red, and will point out Matai bay.

**Rock.**—The only danger in entering Matai bay is a rock in mid-entrance just covered at high water, which has 25 fathoms round it, and lies little more than one mile N.N.E.  $\frac{1}{2}$  E. from the extreme of the peninsula, Jolliffe point; with north-east winds this bay has little or no protection.

**ORURUA BAY.**—This small bay is immediately to the north-west of Knuckle point; it has also a rock in its entrance, bearing N.N.W. little more than half a mile from the point.

**DOUBTLESS BAY** is  $5\frac{1}{2}$  miles wide at its entrance, and 8 miles in depth; its south-east point, Flat head, which has a flat-topped islet lying immediately off it, bears from Knuckle point S.E. by E.  $\frac{1}{2}$  E. 6 miles distant. When four miles within the entrance the bay opens out to a width of nine miles, and has a sandy beach of 7 miles in extent on its western side; Monganui harbour is in the south-east corner, distant from the Flat head islet nearly 5 miles.

**Albert Rocks.**—A depth of 24 fathoms will be found across the mouth of Doubtless bay, and the only dangers are the Albert rocks, and the Fairway reef, on its eastern side; the former are two rocks nearly 2 cables apart, well out of water, with 10 fathoms between them; they lie W. by S.  $\frac{3}{4}$  S.  $2\frac{1}{4}$  miles from the Flat head islet.

**Fairway Reef** is nearly one-third of a mile in extent, partly above

water and partly awash; it lies S.W.  $\frac{1}{2}$  W. 4 miles from the Flat islet, and  $1\frac{1}{2}$  miles S.W. by S. from the Albert rocks; there is a channel of more than a mile in width between these dangers and the eastern shore of the bay, and vessels bound to Monganui harbour from the eastward always pass inside them.

**MONGANUI HARBOUR\*** is more adapted for small than for large vessels, although it has afforded shelter for several whale ships together; it is  $1\frac{1}{2}$  cables wide at the entrance, and carries an average width of nearly two cables for a distance of three-quarters of a mile in a south-east direction; it then expands into extensive mud flats, which, when the tide is out, are nearly dry, leaving a channel on both shores for boats for  $1\frac{1}{2}$  miles round Government island, which lies at the head of the harbour; at the back of this island the land is low and swampy, with mangrove flats.

**Anchorage.**—The least depth between the heads at low water is 4 fathoms, and they may be passed within fifty yards; on the hill over the south head is a signal staff; large vessels must anchor in the centre of the stream, and should moor; 4 fathoms will be found three cables within the heads, the water then shoals to 3 fathoms, and deepens again immediately above some rocks which extend above water off the north shore little more than half a mile inside the north head: these rocks narrow the width of the channel to  $1\frac{1}{2}$  cables; above them is the best and most sheltered anchorage for a vessel going to make any stay; she should drop her anchor in  $4\frac{1}{2}$  fathoms just after passing the rocks, and moor; two cables above them the water shoals very suddenly.

Coasters may lie in 10 feet at low water abreast White's point, but not so high up as to open out the magistrate's house, which is on the upper south point of the harbour, nearly half a mile above the rocks and one mile from the entrance. An English settler resides in the bay immediately round the boulder point on the north shore, who supplies vessels with refreshments, and will act as pilot if required. There is a good anchorage outside the harbour in 6 and 7 fathoms in moderate weather.

**Tide.**—It is high water full and change in Monganui harbour at 8h. 15m.; the range of tide from 5 to 7 feet; the tides run in the harbour from 2 to 3 knots, and with north-west winds a swell sets into the entrance.

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\* See Admiralty plan, No. 1,791, by Mr. Halloran, R.N., 1845; scale,  $m=10\cdot0$  inches. Monganui harbour is much frequented by vessels engaged in the whaling trade on the coast, and from its proximity to their whaling grounds, is more convenient than Kororika. The depth of the water in the middle of the harbour is less by 2 feet than shown in the chart by Mr. Halloran. Supplies of meat and vegetables can be obtained here. A new settlement has been formed in the neighbourhood, which will better enable them to meet the demand; water can also be obtained. Remark Book of Captain C. H. Vernon, R.N., H.M.S. *Iris*. 1860-1861.

The best time to leave Monganui harbour is early in the morning, when there is generally a land wind or a calm; in the latter case a vessel may easily tow out with her boats; the tides must of course be attended to in entering or leaving.

**Coal.**—In a sandy bay immediately to the westward of the harbour, coal is found in seams, but it is of very inferior quality.

**Rock.**—There is a rock above water a quarter of a mile off the west point of this bay, one mile from the harbour's mouth; and on either side of it, east and west, at the distance of nearly two cables is a rock awash at low water.

**Taipa River.**—3 miles to the westward of Monganui harbour is the Taipa river, navigable a short distance for large boats; it has 5 feet at the entrance at low water: there is a rock above water off the mouth with 3 fathoms on either side of it. One mile westward of Taipa river is a small rocky peninsula, and then commences the long sandy beach which extends round Doubtless bay.

**FLAT HEAD.**—From Flat head islet the coast trends east, 7 miles, to the western head of Wangaroa bay,—one mile south-east of Flat head islet two high rocks lie close off the coast, and a bay runs in for some distance, but with no sheltered anchorage: the coast is then bold and cliffy. North-west of the west head of Wangaroa bay, a quarter of a mile off shore, is a high rock (Cone rock), with a smaller one out of water near it; there are 17 fathoms close outside them, and in a bay two miles to the westward is a small high islet (Sugar loaf), nearly a mile from the shore; there are no dangers about these rocks, but what are visible.

**WANGAROA HARBOUR and BAY.\***—The entrance to Wangaroa harbour lies from the west head of Wangaroa bay S.E. by E.  $\frac{1}{2}$  E.  $4\frac{1}{2}$  miles; an excellent mark for this harbour is Stephenson's island (*Mahinepua*), which lies in a north-west and south-east direction, is  $1\frac{1}{2}$  miles in length, and half a mile in width at its southern end; the south-east extreme bears from the entrance of the harbour N.N.E.  $2\frac{1}{2}$  miles: it is high, and tapers away gradually towards its north-west extreme, where it is nearly divided; it has two bays on its western side, and off the south-west point are two rocks out of water.

**Anchorage.**—Stephenson's island affords considerable shelter to Wangaroa bay; anchorage can be obtained in 9 and 11 fathoms anywhere between it and the shore, and good shelter with any winds that would prevent a vessel entering the harbour. The land about the entrance of Wangaroa harbour is high, with steep cliffy shores, particularly on the western side.

**False Head**, a remarkable straight bluff, is one mile to the westward of the entrance, and has two or three high rocks standing off it.

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\* See Admiralty plan, No. 1,092; scale,  $m = 3.0$  inches, by Captain Stokes, R.N.



**Directions.**—The entrance to the harbour is through a narrow channel, one third of a mile in length, in a north-east and south-west direction, the least width being about 250 yards: the shores are high and steep on either side, and may be approached boldly, there being 9 and 10 fathoms close to the cliffs. The tides in the entrance run from 2 to 3 knots, and the wind is always baffling, unless blowing directly in or out; small vessels may easily work through with the tide, but the sea breeze, which is generally regular, blows directly through the passage, and large vessels should wait at anchor outside for it.

Wangaroa is an excellent harbour when inside: the average width of its main branch, which runs in for more than 2 miles, is about a third of a mile; but there are three bays on the eastern side which afford good anchorage, nearly out of the tide, the two outer ones in 6 and 7 fathoms: the most convenient anchorage, however, is in Kaouou bay on the western side of the harbour, immediately inside the entrance.

**Kaouou Bay.**—There are two rocks in this bay nearly awash at high water; they are a cable apart, with 9 fathoms between and deep water all around: the outer one bears from the inner western entrance point, which is a small rocky peninsula, W. by S.  $\frac{1}{2}$  S., nearly 4 cables and from Middle head, which is the south head of Kaouou bay, N.W. by N., the same distance.

**Directions.**—These rocks may be passed on either side; but it is recommended, after passing the rocky peninsula just mentioned, to steer to pass on their south side half a cable, anchoring in 5 fathoms, 2 cables above them.

**Anchorage.**—This will be found an excellent anchorage, quite out of the tide, and free from the eddies and irregular tides which prevail in almost every other part of the harbour, and which, together with the baffling winds, render the entrance to the bays on the eastern side frequently difficult and tedious for a sailing vessel.

**Caution.**—A shoal sand patch of 15 feet extends off Middle head, nearly 2 cables to the northward, but there is plenty of room for the largest ships between it and the two rocks described. H.M.S. *Havannah*, and several other of H.M. ships, have anchored in this bay; a vessel may anchor outside the two rocks, if convenient, in 7 or 8 fathoms, but she will scarcely be out of the influence of the tide or a swell which generally sets in through the entrance with a strong north-east wind.

Vessels leaving Wangaroa harbour should choose the early morning, as there is generally a light land wind or calm at that time; in the latter case no difficulty will be found, if the boats are ahead, to keep the ship's head in the proper direction, taking advantage of the tide.

The land round the harbour, except at the head, is high and steep;

deep fissures penetrate the coast, and high cubical masses of rock are piled one above the other to a height of several hundred feet; this is particularly the case at the head of Kaouou bay.

**Peach Island**, a high remarkable looking island, lies in the centre of the harbour half a mile from the entrance, at the entrance of Owanga bay on the east side; there is deep water all round it.

The most remarkable objects in this singular harbour are two cupola-shaped hills, mounts St. Peter and St. Paul; they lie on opposite sides of the harbour, 2 miles from the entrance. St. Paul, on the eastern shore, is a striking feature, resembling the dome of that cathedral, hence its name; the water at the head of the harbour within the line of this mount is shallow, and mud flats dry for one mile off the shores.

Several tide creeks among mangrove bushes, extend for some distance inland, navigable for boats and leading to the kauri forests.

**Mission**.—On the west side, at the head of the harbour, is the French Roman Catholic mission establishment.

**Vegetables** and fruit, including grapes, peaches, &c. are cultivated here to a considerable extent, and with much success; fresh water may be had from the streams in any of the bays.

**West Bay**.—Independent of the anchorage which may be obtained outside the heads, by vessels waiting to enter or for other causes, shelter from westerly winds will be found in West bay, one third of a mile off the Sandy beach in 5 fathoms; within that distance the water is shallow:—this bay is one mile to the westward of the False head of Wangaroa; there is another sandy bight one mile to the north-west of it, with a flat rock (Kava islet,) two cables off the shore, having a depth of 5 and 6 fathoms between.

Eastward of the entrance of Wangaroa harbour one mile, is a small river navigable for boats; off its west sandy point, a reef of rocks out of water extends a quarter of a mile: nearly one mile farther eastward are the Arrow rocks high out of water, with straggling rocks around them; they extend in a north-west direction half a mile from the shore, and should be given a berth of the same distance, as the tides sweep with some strength between Stephenson's island and the main: nearly one mile again eastward is the eastern point of Wangaroa bay, with an islet lying close off it.

**Tides**.—It is high water in Wangaroa harbour on the full and change days at 8h. 15m.; the springs range 7 feet; the flood stream on the coast sets to the westward, and the ebb to the eastward.

**FLAT ISLAND** is the next remarkable object eastward of Wangaroa bay; it is a low bare island, E. by N., nearly 4 miles from Stephenson's island and is immediately off the point of a bay; it is half a mile in length from north to south, and although its outer extreme has the appearance of a shelving point, it may be passed within 2 cables in 20 fathoms.

**CAVALLI ISLANDS.**—Eastward of Flat island, 4 miles distant, is an extensive group of small islands, occupying a space of nearly 5 miles from north to south, and more than 2 miles from east to west.

The centre island or great Cavalli, is nearly 2 miles in length north and south, and one mile from east to west; around its north and east sides, within a radius of  $1\frac{1}{2}$  miles, are dispersed ten small islets, high, and having several rocks scattered among them, particularly on the east side; there are soundings 20 fathoms half a mile outside this group; off the western side of the Great island, a quarter of a mile, is a rock high above the water.

The island next in size lies south-east of great Cavalli nearly a mile; it is a very remarkable steep rocky island, one mile long east and west; its summit rises in regular steps, and from this circumstance it has been called Step island; between Step island and great Cavalli is a cluster of rocks above water, and one sunken, with no safe passage between.

**Tides.**—It is high water, full and change, at the Cavalli islands at 8h. 0m., rise 7 feet.

**Cavalli Passage** is the channel between this group and the main land: in its narrowest part, which is abreast Step island, the width is more than half a mile, and the least depth 17 feet at low water: in the centre of the channel between great Cavalli and the mainland, is a rock nearly awash at high water, and almost always breaking: this rock lies from the south-west end of great Cavalli, S.S.W. half a mile, and the same distance from the main, and may be passed on either side in 6 and 7 fathoms: this is a safe passage for small vessels, and coasters always take it.

In fine weather anchorage may be had for small vessels in the sandy bay on the south side of great Cavalli, sheltered by some rocks which extend off its western point, and also in Matauri bay on the main land immediately westward of Step island, where there is a native village.

**TAKO BAY.**—From here the coast trends south-east round Tako bay 8 miles to Ngatoka Rarangui point, which has a high hill (Nipple hill), rising over it, and three rocks, the Needles, lying a short distance off to the westward of the point, nearly one mile, is a small islet; there are no dangers in Tako bay, except a rock out of water 4 miles westward of the point, nearly half a mile off shore, neither is there any sheltered anchorage; at the distance of one mile off shore there are 13 and 14 fathoms. E.S.E.,  $3\frac{1}{2}$  miles from Ngatoka Rarangui point, is cape Wiwiki, the western cape of the Bay of Islands.

**BAY of ISLANDS.\***—This extensive bay or gulf is comprised between

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\* See Admiralty plan, Bay of Islands, No. 1,090; scale,  $m = 2\cdot0$  inches, by Captains J. L. Stokes and G. H. Richards, R.N., 1849.

capcs Wiwiki and Brett, and is 11 miles wide at its entrance ; a peninsula 3 miles in length, extending in a north-west direction from about the centre of the bay, may be said to divide it into two distinct portions.

In the western are port Tepuna and the Keri-Keri river ; farther south, and on the western side of the peninsula just mentioned, is Kororarika bay, the principal and best known anchorage, with a flagstaff erected on the hill which overlooks it ; and above this bay again the rivers Kaua-Kaua and Wai-Kari, which run for a considerable distance to the southward and the eastward ; the eastern branch communicating within a short distance of the harbour of Wangarura, on the east coast. In the eastern portion of the bay are the numerous islands from which the name is derived ; these, together with the peninsulas that cut up its southern coast, afford many good and secure anchorages.

The depth of water within the line of the outer capes does not exceed 40 fathoms, and there are few dangers that do not show themselves.

The western portion of this extensive bay, commencing at cape Wiwiki, will be the first described.

**CAPE WIWIKI.**—This cape, which forms the western entrance point of the bay, is a steep bold headland, its summit, mount Pocock, being 843 feet high ; it is a dark coloured mountain rising abruptly on its northern and eastern sides, with the southern slopes well wooded nearly to the summit.

**Galakek Island.**—Immediately off cape Wiwiki, scarcely half a cable distant, is Motu Galakek, a small island of moderate height, with a rock above water a cable north of its eastern end.

**The Wine Pin** (*Tiki-Tiki*), a high black pinnacle rock, lies half a mile north-east of this island, with a passage between 3 cables in width, and 12 fathoms water ; this isolated and very remarkable rock is an excellent guide for a stranger, and may be distinctly seen from a distance of 12 miles.

One mile southward of cape Wiwiki is Howe point, and midway from the coast between them, projects a high round topped cliffy peninsula connected with it by a low neck :—between Howe point and the island Motu Roa, the latter situated 2 miles south of the former, is the passage to the western anchorages of port Tepuna and the Keri-Keri river.

**Motu-Roa** is a long narrow island, lying in an east and west direction, and extending off Toké Toké point on the main land, 1½ miles ; it is 220 feet high, and the channel known as Kent passage between its western extreme and the point is 2 cables wide, with 7 feet at low water.

**Black Rocks.**—Off the northern and eastern ends of Motu-Roa lie the Black rocks, so called from their colour ; they are a remarkable group of smooth flat-topped rocks, about 15 feet high, steep, and with no dangers about them.

**Tepuna or Rangihoua Bay.**—S.W. from Howe point, a quarter of a mile, is a small rock above water; and  $1\frac{1}{2}$  miles westward of the point is Tepuna or Rangihoua bay; here the first missionary station was established in New Zealand, and there are still the houses of settlers; there is anchorage in this bay in 5 and 6 fathoms, sandy bottom, but it is open to easterly winds.

**Tepahi Islands.**—Immediately to the westward of Rangihoua bay are the Tepahi islands, four ragged-looking islands, with shoal water between: a round rock, well out of water and nearly 2 cables in circumference, lies half a mile to the eastward of them; and between this rock and the west point of Rangihoua bay, a quarter of a mile from either, is a sunken rock which breaks at low water.

**Poraë-nui-Point**, three-quarters of a mile to the south-west of the Tepahi islands, is a long projecting point with an isolated hummock on its extreme, on which stands a remarkable tree: this point is 3 miles to the south-west of Howe point, and is the northern entrance point to the western anchorages; Toké Toké point, which bears from it S.S.E. one mile, and has a white sandy beach at its extreme, forming the southern.

From Howe point to this entrance there is a good working channel of nearly one mile in width in the narrowest part: the Tepahi islands on the north shore and the Black rocks on the south may be approached close, and there is anchorage between them, if necessary, in 9 fathoms.

**Onslow or Howe Rock.**—The only danger to be avoided is the Onslow or Howe rock, which lies in the outer entrance, between Howe point and the Black rocks: it has 17 feet on it at low water, and is a perfect pinnacle, with 15 fathoms close to; this rock lies S.S.E. seven-tenths of a mile from Howe point; when on it, the extreme of the projecting peninsula, midway between that point and cape Wiwiki, is in a line with the low western neck of Galakek island, bearing N.  $\frac{1}{2}$  W., and the extreme of Poraë-nui point bearing S.W. by W.  $\frac{1}{2}$  W., is seen just to the northward of the north end of Cocked Hat island, a low triangular shaped island, three-quarters of a mile beyond it.

**Directions.**—There is a passage of nearly three-quarters of a mile wide between Howe point and this rock, with 16 fathoms water, and the point may be passed as close as is convenient; for a mid-channel course between, bring the outer extreme of the south-west or outer Tepahi islands, in line with the hummock on Poraë-nui point, and steer for them until Howe point is on with the Nine Pin, when a vessel will be well to the westward of Onslow rock.

If it is intended to pass to the southward, between it and the Black rocks, the west end of Galakek island should be kept open of the peninsula before mentioned, until the south extreme of the outer Tepahi island

bears W. by S. ; this will lead a quarter of a mile to the southward of the rock, and a course may be steered up the passage for Porae-nui point.

When abreast Porae-nui point, port Te-puna runs to the W.N.W., its entrance being between it and the middle point, which latter is W. by S. three-quarters of a mile from Porae-nui ; the Keri-Keri river taking a westerly direction, and having the low stony triangular Cocked Hat island lying in the centre of its entrance.

**The Brothers, and Slains Castle Rocks** are between Poraenui point and Cocked Hat island, rendering the approach with a working wind somewhat difficult for large vessels ; the Brothers are two rocks more than half a cable apart, awash or breaking, and are consequently easily avoided ; they lie S. by W. from Porae-nui point, the northernmost rock being 2 cables distant from it, with a rocky patch of 17 feet extending half a cable to the northward.

The Slains Castle rock is sunken and dangerous ; it lies W.  $\frac{3}{4}$  N. a quarter of a mile from the centre of the Brothers, in a line between them and the Middle point, and S.W. by W., 4 cables from Porae-nui point, in a line between it and the north end of Cocked Hat island ; it is more than half a cable in extent, and the least depth on it is 8 feet at low water.

**Directions.**—Vessels entering port Tepuna from the eastward, with a leading wind, should pass between Porae-nui point and the north Brother, half a cable from the point in 5 fathoms ; and by steering to the northward of the Middle point, the Slains Castle rock will be avoided ; between the Brothers rocks and the Slains Castle rock there is a passage of 2 cables broad, but it is not advisable for a large vessel to take it.

The widest channel, which is 4 cables broad, is between the Slains Castle rock and the Middle point ; vessels entering port Tepuna or the Keri-Keri by this channel should pass to the southward of the south Brother rock about a cable, and when abreast of it steer west, or for the first point on the north shore of the Keri-Keri river above the Middle point, which is a short half-mile distant from it, and will be readily known, being a small high rocky peninsula ; when the Middle point bears N.W.  $\frac{1}{2}$  W. the rock is well passed, and a vessel may haul up N.N.W. for port Tepuna, or continue her course for Keri-Keri river ; in the latter case, she must anchor about a quarter of a mile above the peninsula point just mentioned, in 5 or 6 fathoms mud, off the mouth of a deep cove ; above this cove the water shoals rapidly ; there is a rocky patch of 16 feet, extending  $1\frac{1}{2}$  cables to the north-eastward of the eastern low point of Cocked Hat island, but the west course above given will clear it well.

**Port Tepuna** is a spacious and well-sheltered anchorage, though rather shallow for vessels of large tonnage to enter far ; it is more than

half a mile in width at the entrance, and a short distance within expands to a mile; at Separation point,  $1\frac{1}{2}$  miles N.W. from the entrance, the harbour divides into two arms, the Poukourou river running to the northward two miles, and what has been called the Monga-nui river—but in reality only a creek terminating in a shallow round mangrove beach, three miles above Separation point,—continuing the direction of the main channel W.N.W.; both are shallow, carrying 6 feet at low water nearly to their heads.

**Anchorage.**—The deepest water in port Tepuna is on the southern shore, where there are 5 and 6 fathoms for half a mile above the Middle point, 4 fathoms more than one mile above, and again for another mile, above 3 fathoms at low water. There are also two snug bays  $1\frac{1}{2}$  and 2 miles above Middle point, where coasters may anchor in 12 feet at low water; off the point which separates these bays, three rocks above water extend for a cable; fresh water is to be procured in streams at their heads.

On the north shore of port Tepuna the water is shoal for a short distance above the Middle point; and from Pah point, a high point with the remains of a pah on it,  $1\frac{1}{4}$  miles above Porae-nui point, rocky ground with 11 feet at low water, extends S.S.W. half a mile, leaving a channel of little more than three cables broad between its edge and the south shore; when Pah point bears N.E., the shoal is cleared, and there are  $3\frac{1}{2}$  fathoms close up to the point.

**Rock.**—A rock awash at low water lies W. by S. from Separation point, and one mile above it are two patches of rocks always out of water.

**River Keri-Keri**, although apparently an extensive sheet of water, is only navigable for boats above the anchorage just mentioned, that is, three-quarters of a mile above the Cocked Hat island, and  $1\frac{1}{2}$  cables from the north shore, in 5 fathoms mud; there is no channel southward of the island, and at low water extensive flats and large stony patches are uncovered; boats can go 5 miles above the entrance, when further navigation is stopped by the falls; at low water the best boat channel is along the north shore.

**Anchorage.**—Coasters pass through the Kent passage; and in the bay to the westward, between it and Cocked Hat island, there is anchorage in 7 fathoms.

**Tapeka Point.**—From the easternmost Black rock, Tapeka point, the northern extreme of the Kororarika peninsula bears S.S.E. nearly 2 miles; several detached rocks well out of water, and on which there is generally a break, extend for nearly a quarter of a mile from it; they are all visible, and may be passed within half a cable in 6 fathoms.

Between Tapeka and Manawaroroa points, which latter is directly west

of the former,  $1\frac{1}{4}$  miles distant, is the entrance to Karorarika, and the southern anchorages; this entrance, however, is contracted to little more than half that width by the Brampton or Favourite bank, which extends more than three-quarters of a mile off Manawaroroa point.

**Manawaroroa Point**, or more properly speaking flat, for it occupies an extent of three-quarters of a mile north and south, is a low and shelving projection composed of rocks and swampy ground, which dries a quarter of a mile from the shore at low water.

**Brampton or Favourite Bank**.—The southern limit of this bank commences at the south point of Hume creek, which is 3 cables south of the southern part of Manawaroroa, and its northern at more than half a mile from the north end of the flat; thus its base occupies an extent of a mile and a half, and the bank terminates in a point three-quarters of a mile eastward of the centre part of it from low-water mark. The depth of water is from 6 to 15 feet, and it shoals suddenly from 5 fathoms to the latter depth; in strong northerly or easterly winds the sea breaks heavily on it, with a long rolling surf; this bank offers no difficulties whatever in entering or leaving the port with a leading wind, as there is a clear channel of three-quarters of a mile in the narrowest part between it and Tapeka point.

The outer extreme of the easternmost Black rock, in a line with the Nine Pin, bearing N.  $\frac{3}{4}$  E., leads directly on the tail of the bank, and the extreme of the Black rock in a line with the outer extreme of the Motu Galakek, clears it  $1\frac{1}{2}$  cables outside in 6 fathoms.

**KORORARIKA BAY and ANCHORAGE**.—A vessel entering with a leading wind should keep a quarter of a mile outside the rocks off Tapeka point,—as also the point next to it,—and Kororarika point, as off these points, rocks lie scattered above water; on passing the latter point, the town will open out, and the best anchorage is in the centre of the bay in 4 fathoms mud, with the rocks off Kororarika point bearing N.W.  $\frac{1}{4}$  N., and the western end of Motu-roa island well open of them; with Moturoa island shut in, there is only 15 feet water.

**Observatory Islet**.—Off the south point of Kororarika bay is the small rocky islet Kairaro, or Observatory islet, it is 60 feet in height. This islet can be advantageously used as a leading mark to clear the Brampton bank.

**Directions**.—Working up for Kororarika anchorage, a vessel may stand to the westward without fear until Observatory islet is just opened out to the southward of Kororarika point, when she will be in not less than 6 fathoms, and must tack to the eastward; this turning mark will hold good until the outer rock of Tapeka point is in a line with the south-west point of Motu Arohio, bearing E.N.E. (Motu Arohia is the first island eastward



of Tapeka point, distant nearly 2 miles); when these marks are on, then the clearing marks to the northward must be taken up; that is, the outer extreme of the outer Black rock must not be brought to the eastward of the outer extreme of Motu Galakek, which will clear a vessel  $1\frac{1}{2}$  cables of Brampton bank in 6 fathoms.

**Hermione Rock** is another danger which must be avoided in working up; it is a patch with 2 feet water on it at low springs, and which very rarely breaks; from it Mr. Busby's house, a prominent object on the north side of Waitangi river, bears S.W. by W., and it lies from the north end of Motu Mea island, N.W. by N. half a mile; from Kororarika point, S.W. by W.  $\frac{1}{4}$  W. one mile and one tenth, and off shore 4 cables. The marks which clear the Brampton shoal would lead very close on this rock; the outer Black rock must, therefore, not be brought outside, or to the eastward of the centre of Galakek island, when approaching the neighbourhood of the Hermione rock.

**Motu Mea Island.**—A narrow island, one-third of a mile in length, lies off the entrance of the Waitangi river; it is connected with the main land by a ridge extending from its southern extreme, nearly dry at low water, but having a boat channel close to the shore; it has also shoal water, extending more than a cable to the eastward, and a reef of rocks  $1\frac{1}{2}$  cables off its north end, the outer ones of which are covered.

**Tides.**—It is high water full and change at Motu Mea at 7h. 15m. Springs rise 9 feet, neaps 6 feet.

**Waitangi River** is S.W.  $1\frac{1}{2}$  miles from Kororarika point; small vessels enter this river, and they must either pass between Hermione rock and the shore in  $3\frac{1}{2}$  fathoms, or between the rock and Motu Mea; in the latter case, Mr. Busby's house in a line with a remarkable one-tree hill,  $1\frac{3}{4}$  miles to the westward of the house inland, leads between in mid-channel in  $3\frac{1}{2}$  fathoms, when the river may be steered for; a store-house stands on the north point, and from the latter a boulder spit runs half a cable dry at low water; 5 feet is the least water at the entrance at low springs, and 12 feet inside; vessels can proceed a very short distance up; with strong north-east winds a swell sets into the river.

**Paihia Village** (the Church mission station) is in a sandy bay to the southward of Motu Mea. There is no good anchorage in the bay, as the water shoals for a considerable distance, and it is exposed to northerly winds; the lights of Paihia village at night will be found a guide to clear the Brampton shoal; when they are seen to the eastward of Motu Mea, a vessel is to the eastward of the tail of the bank; to the northward of Manawaroroa point, however, they would not be available, as a vessel may stand far enough to the westward to open them out westward of the island.

The small island Motu Arahi, or Paihia islet, lies about a cable off the south point of Paihia bay, and on the opposite shore is Toré Toré peninsula; the distance between these two points is 4 cables, and they may be said to be the entrance points to the upper anchorages.

**Toré Toré Peninsula** is two cables long in an east and west direction, and is connected with the main land by a narrow rocky neck, which at high water springs is covered; its extreme point is S. by W.  $\frac{1}{4}$  W. one mile from Observatory islet. Pomaré bay, the deep bight running to the south-east between Korararika and this peninsula, has from 10 to 16 feet water in it.

**Wahapu Bay.**—On the eastern shore above Toré Toré peninsula are two deep bights, Wahapu and Pipi-roa. The former, which is immediately round the peninsula, was formerly the military station of the district, and there is anchorage off the barracks for vessels drawing 8 feet; the latter is a shoal double bay; the south point, Okiato, will be known by a large wooden house being built over it.

From Toré Toré to Tapu point the north entrance point of the rivers, or more properly speaking the inlets of Waikari and Kaua-Kaua, is  $1\frac{3}{4}$  miles in a S.E. by S. direction, with a narrow but deep channel.

A cable outside a line drawn from Toré Toré extreme to this point is the limit of shoal water on the eastern side of the channel; its western edge is defined by a line drawn from the outer point of Motu Arahi to the point opposite Okiato house; inside this line on the western shore, sand banks dry at low water, and the bank is very steep, shoaling from 7 fathoms to a few feet. This channel is nearly 2 cables wide, with a depth of from 6 to 9 fathoms, and the edges of the banks may generally be distinguished by the tide line.

**Water.**—On the western shore, immediately opposite to Okiato house, is an excellent watering place.

**Waikari River.**—Tapu point, the northern entrance point of the inlets is a rounding flat-topped grassy point, of peninsula formation; the distance between it and the southern entrance point being a quarter of a mile, with 11 fathoms water between them; from here the Waikari turns to the eastward for  $2\frac{1}{2}$  miles, being navigable for coasters for that distance, where there is a small island lying in the middle of the stream, From this island it runs E.S.E. 2 miles towards the harbour of Wangaruru on the east coast, and is navigable for boats for that distance. On entering Waikari river the small round islet of the same name will be seen on the southern shore off Pomaré's pah, E.S.E. half mile from Tapu point.

**Anchorage.**—Ships may anchor a quarter of a mile above Waikari islet, in 5 fathoms, about a cable off the Pah point; a deep bight

runs to the southward for a mile, immediately to the eastward of this point, but within the line of its entrance points there are only 3 feet at low water.

H.M.S. *Basilisk* in 1873, anchored in the Waikari river for the purpose of obtaining coal off the mouth of the Kaua Kaua river in  $10\frac{1}{2}$  fathoms on the following bearings :—

Waikari island	-	-	E. by S. $\frac{3}{4}$ S.
Waimangaroa point	-	-	S.W. by W.

The passage to this anchorage from Kororarika bay is narrow and intricate for large ships, but may be rendered easy if buoyed.\*

**Pilot.**—A Government Pilot is stationed at Kororarika.

**Coal.**—The coal mines in the Bay of Islands are situated about 5 miles up the Kaua Kaua river; the river is shallow and full of mud banks, only available for small coasters at high tide.

The mines cannot at present supply more than 120 tons per day, but as new machinery is in course of erection, a large increase may be anticipated. The coal is brought alongside the ship in lighters holding from 80 to 100 tons. The price charged is sixteen shillings per ton.

The coal is small, but generates steam rapidly; it produces a thin clinker, and little ash. The tubes rapidly become choked from the great deposit of soot. The smoke is very dense and dirty as compared with Australian coal; the following results were obtained on board the *Basilisk* ;—

Average distance run per ton of coal,—

Newcastle, New South Wales	-	10 miles.
Bulli Do.	-	9 „
Bay of Islands, New Zealand	-	7·4 „

But the price of Australian coal in New Zealand is from forty to fifty shillings per ton, whilst the Bay of Island coal is only sixteen shillings if shipped on the spot.†

**Kaua-Kaua River** is very shallow, and only fit for boat navigation; southward of a line from Waikari islet to its western entrance point there are only 9 feet; it runs to the southward for 3 miles, and is navigable for boats at high water for that distance, when it branches off to the south-east and south-west, and is lost in the mangrove swamps.

**Bank of Kororarika.**—To the southward of a line from the south end of Kororarika bay, to Mr. Busby's house on the opposite shore at Waitangi, the water shoals to  $3\frac{1}{2}$  fathoms; and there is also a bank, with 16 feet at low water, lying between Kororarika bay and Toré Toré point.

\* See Admiralty chart, Bay of Islands, No. 1090, scale,  $m=2$  inches.

† Captain J. Moresby, R.N., H.M.S. *Basilisk*.

**Directions.**—A vessel bound above Kororarika, without touching there, and drawing more than 16 feet water, should pass Kororarika point at a distance of a quarter of a mile, and then steer S. by E. for the eastern end of Paihia islet (*Motu Ahari*) until the north end of Motu Mea is in one with Mr. Busby's house, bearing W. by N., which will not take her into less than 20 feet at low water; when these marks are on, she should steer S.S.E.  $\frac{1}{4}$  E., or mid-channel between Toré Toré peninsula and Paihia islet, when the water will shortly deepen to 6 and 9 fathoms, and this course will lead mid-channel nearly to Okiato point, when the shores are bold on either side.

A vessel of the same draught, leaving Kororarika for the upper anchorages, to avoid the 16-foot bank should steer for the south end of Motu Mea, until the north end of that island is in one with the store-house on the north entrance point of Waitangi river, bearing W. by S.; she may then steer the course before directed, between Toré Toré peninsula and Paihia islet; a direct course from the anchorage at Kororarika, for this entrance leads over the outer part of the shoal in 17 feet at low water.

**Kororarika or Russell** is the only place in the Bay of Islands at present of any commercial importance, and ships requiring supplies must proceed to this anchorage; a resident magistrate, as well as several European settlers, are established here. Vessels requiring refit may obtain almost any stores they may stand in need of, in addition to live stock, provisions, and refreshments. There is weekly communication with Auckland by steamers.

**Water.**—Water may be had from a stream at the north end of the bay, but not so good, and with less facility, than at the stream before mentioned above the Toré Toré peninsula.

**Oysters.**—Oysters abound on the rocks, below high-water mark, in all parts of the bay, except in the immediate neighbourhood of the settlements, and indeed on the whole extent of the east coast as far south as Auckland.

Numerous whaling vessels resorted to the Bay of Islands for refreshments and supplies before the regular colonization of the islands, but since then their visits have declined considerably; the establishment of Customs' officers, and the prohibitory laws with regard to exchange with the natives, may be assigned as the chief causes.

The eastern portion of the Bay of Islands, which has now to be described, is included between Tapeka point and cape Brett, a distance of 11 miles, in a N.E. by E. and S.W. by W. direction: the part, however, which is sheltered by the islands, and available for anchorage, extends only 6 miles eastward of Tapeka point, the remaining distance of 5 miles being a steep cliffy indented coast, without shelter as far as cape Brett.

**The Rawiti.**—The extensive sheet of water included between the

islands and the main land is called the Rawiti. The islands which constitute its northern boundary are six in number, besides several smaller islets and rocks; their greatest length, which is generally in a north-west and south-east direction, varying from three-quarters to  $1\frac{1}{4}$  miles.

The southern shore of the main land is cut up into deep and extensive bays and creeks, formed by the curiously-shaped peninsulas which are so characteristic a feature of New Zealand, and they afford excellent anchorages for vessels of moderate draught. The Rawiti itself is capable of containing and affording good shelter to any number of ships of the largest tonnage; still it is not without its shoals, and a due attention to the chart will be required to avoid them.

The western entrance is between Tapeka point and Motu Arohia, the western island, and is more than  $1\frac{1}{2}$  miles in width, with a depth of 14 fathoms.

**The Eastern or Albert Channel** is between Orupukupuka the eastern island and Richards peninsula, its width being not more than a quarter of a mile; small vessels rounding cape Brett with a scant wind from north-west avail themselves of this passage, as they can obtain anchorage when inside it, or work up in smooth water,—vessels in distress have also entered under the same circumstances; the *Hope* whaler, which struck on a reef on the north side of the channel (since named after her) ran through it into the Rawiti; this channel, however, is not fit for a large vessel; the ground is foul and irregular, and two rocky patches of 15 and 16 feet lie in the centre of the entrance; there is also frequently a heavy swell setting into it.

**Directions for Rawiti Island Passages.**—There are two passages into the Rawiti, between the islands, which may be run for, if necessary, by observing the following directions:—Between Motu Arohia, a narrow island, a mile long, east and west, and Motu Rua, the island east of it, there is a passage of half a mile in width; there is a rock in this passage which is always visible, lying  $1\frac{1}{2}$  cables off the west end of Motu Rua; a vessel entering the Rawiti by this channel should pass just to the westward of this rock in 7 fathoms, and, by keeping between a quarter and a half a mile distant off the west side of Motu Rua, she will not get less than 5 fathoms, and will shortly deepen to 9; by keeping this distance from the island she will pass to the eastward of a small patch of 17 feet at low water, which lies nearly three-quarters of a mile S.W. of its south point, and which will be noticed hereafter; two steep cliffy islets and a large rock above water lie off the north-west end of Motu Rua, but they are free from dangers.

**Keke.**—The next island eastward of Motu Rua, and a quarter of a mile distant from it, is Keke; it is the smallest of the group, being seven-tenths of a

mile long north-west and south-east, and scarcely a quarter of a mile in width; there is no channel for a vessel between these two islands, and a small islet lying across the northern entrance narrows its width to one cable with only a few feet of water.

**Orupukupuka**, the largest and the easternmost island of the group, lies a third of a mile eastward of Keke island; three rocks above water extend off its western point, and there are two sandy bays on the west side of the island with shoal water; its south-east extreme is the northern entrance point of the eastern or Albert channel.

The islands Otawaki, and Okahi or Red island, lie to the north-west of and in a line with Orupukupuka, there being boat channels of one cable between them. Okahi is the northernmost island of the group; it has a steep rocky islet lying close off its south-west point, and its northern side is a precipitous cliff with a round red summit known as the Red head, and which will be immediately recognized on rounding cape Brett; some rocky islets extend more than one cable off this head, and a little more than half a mile from it is the Whale rock.

**The WHALE ROCK** is the only danger in entering the Bay of Islands from the eastward; this rock generally breaks at low springs, or when there is any sea. There is a clear passage of 4 cables with 12 fathoms water between it and Red head, from which it bears N.W. by W.  $\frac{1}{2}$  W. half a mile.

**Second island passage** is between Okahi, or Red island, and Keke. For one mile within Red island, or as far as the west end of Orupukupuka, there is a channel of half a mile in width, with 9 fathoms in the centre, and not less than  $3\frac{1}{2}$  fathoms close to the shore on either side. The western end of Orupukupuka, with the three rocks off it, narrows the channel to little more than three cables, when the water shoals to  $4\frac{1}{2}$  fathoms; after passing this point nearly half a mile, there is a belt of the width of 2 cables to be crossed, with 16 feet on it at low water, when a vessel will be fairly in the Rawiti in 7 fathoms.

**Directions.**—To enter this passage, a mid-channel course should be steered between the islands, until abreast of three large flat rocks off the south-east end of Keke island (which course will be S.E.  $\frac{1}{2}$  E.  $1\frac{1}{2}$  miles), or direct for the northern end of Poro-poro island, which lies in the southern entrance of the channel; pass the easternmost of these three rocks at a distance of 2 cables, and when it bears West there will be 16 feet at low water, on the northern edge of the belt. Steer then south for a quarter of a mile, when it will be passed; and if bound to the westward, a course may be steered accordingly; if to the eastward, or for any of the anchorages on the southern shore, it must be remembered that a shoal of 9 feet at low water, with a sunken rock almost awash at its extreme,

extends half a mile south from the north-west end of Poro-poro island ; vessels will scarcely have occasion to enter these island passages unless with a leading wind, when both will be found easy.

A general description of the different channels which lead into the Rawiti from seaward having now been given, it will be necessary to point out the dangers to be avoided within, and to describe the anchorages on its southern shores, commencing from the westward. This extensive sheet of water, as has been before observed, has anchorage all over it ; the general depth is from 6 to 9 fathoms, with good holding ground.

**Capstan Rock.**—The first danger eastward of Tapeka point is the Capstan rock (*Outou Rodi*). The natives assert that this rock was not long since awash, and that they have grounded their canoes on it to fish ; in this case its head must have been washed off by the sea, which is not improbable, as the bottom in the shoal places is of coral formation ; it is now a mere point, with the least depth on it at low water 12 feet, and 7 fathoms close round ; the position of this rock is little more than half a mile from the centre of Honiroa beach ; it bears from Tapeka point E. by S.  $1\frac{1}{4}$  miles, and is exactly in a line between it and the east point of Paroa bay (*Kahuwera* point) ; from the south-west end of Motu Arohia it is S. by W.  $\frac{3}{4}$  W.  $1\frac{1}{10}$  miles, and from the west point of Honiroa bay N.E. by E.  $\frac{1}{2}$  E. six-tenths of a mile.

**Paroa Bay** is  $2\frac{3}{4}$  miles eastward of Tapeka point ; it is half a mile wide at the entrance, runs to the south-east for one mile, and has 17 feet at low water just within the entrance points ; this is a small vessel anchorage, and is not well protected from north-west winds ; the best shelter is in 9 feet at low water on the west side of the bay.

**Manawara.**—Immediately eastward of Paroa bay, and only separated from it by the narrow peninsula of the same name, is Manawara bay ; it runs to the south-eastward for 2 miles, terminating in Clendon cove, which has only 10 feet water a short distance within the entrance ; there are also two bays on its eastern side, in both of which there is anchorage for small vessels.

**The entrance to Manawara bay** is three-quarters of a mile wide, and is formed by two peninsulas ; that of Paroa on the western side, and on the eastern by the Native peninsula ; off the point of the latter is Bateman islands, with rocks between and no passage. There is an extensive shoal extending from the western entrance of Manawara to the north-west, or directly towards the sandy bay at the eastern end of Motu Arohia for a distance of one mile ; the least depth on it at low water is 13 feet, except on one small patch of 7 feet, which lies S.W.  $\frac{1}{2}$  W. half a mile from the north-west end of Bateman island, or with the high summit of Mosquito

point seen over the centre of that island bearing N.E. by E.  $\frac{1}{2}$  E.; vessels drawing not more than 11 feet, by avoiding this one patch, which they may easily do by passing within a quarter of a mile of the west head of the bay, may run into Manawara bay at any time of tide and anchor in either of the coves; Oraukaua, the north-eastern cove, is the best, and has  $3\frac{1}{4}$  fathoms at low water well within it; the middle cove has 14 feet within a reef of rocks which extend off its north shore; and Clendon cove abreast its entrance point has 15 feet; coasters can go higher up.

**Directions.**—A vessel drawing 17 feet may enter Manawara at low water, by passing to the northward of the tail of the shoal, and taking the narrow passage on the eastern side of the bay, as follows:—coming from the westward, steer along the south side of Motu Arohia at a distance of half a mile, (for a coral bank with 14 feet at low water extends more than a quarter of a mile south of its central part,) until its eastern end bears N.W. by N., then steer S.E. by S. or to pass half a cable off the north-west low extreme of Bateman island; continue on this course for a distance of four cables after passing the extreme, or until the Knob, or north-west point of Oraukaua bay, is on with the sandy beach of Opuna cove bearing E.  $\frac{1}{4}$  N., when, haul up to pass the Knob point at the distance of half a cable in 5 fathoms.

**Anchorage.**—As soon as the point is passed, haul in and anchor a quarter of a mile within it in  $3\frac{1}{2}$  fathoms at low water, or anchorage may be had in 5 fathoms nearly 3 cables south-east of the Knob point if required, though not so well sheltered.

**Directions.**—In passing through the Rawiti to the eastward, the marks for clearing the tail of the shoal off Manawara bay are, to keep the islet point, which is nearly a mile eastward of Mosquito point, just open to the northward of that point, which will lead one cable north of it in 4 fathoms; when the east end of Motu Arohia bears N.N.W., the shoal, which has on its extreme 15 feet at low water, will be passed; and continuing on the same course E. by N.  $\frac{1}{2}$  N. to pass a convenient distance from Mosquito point which is bold close-to, the shoal patch of 17 feet at low water, and which lies half a mile E. by S. from the east end of Motu Arohia, will also be avoided, that course leading southward of it nearly a quarter of a mile; there are  $3\frac{1}{4}$  fathoms between this patch and Motu Arohia; and for more than  $1\frac{1}{2}$  miles to the eastward there is a clear space free from all dangers, with anchorage in from 7 to 8 fathoms.

**Poro Poro Island.**—The next danger to be avoided is the shoal, with a sunken rock at its extreme southward of Poro-poro island, and which has been noticed in describing the second island passage; this shoal, which extends from both extremes of the island, has 10 feet at low water; the rock on its extreme end bears from the north-west low point of the island



S.  $\frac{1}{4}$  E., exactly half a mile distant. In steering to the eastward through the Rawiti, so long as the centre south point of Motu Arohia is not shut in by the eastern point of that island, a vessel will be well to the southward of this rock; when the two points are just touching, she will be 2 cables south of it in 7 fathoms; when steering on this line the north-west low point of Poro-poro island is in one with a double rock lying off the centre point which separates the two sandy bays on the west side of Orupukupuka island bearing N.  $\frac{1}{4}$  W., she will be abreast the rock; stand to the northward these last marks lead directly on it.

**Parekura** is the next bay eastward of Manawara, being little more than 2 miles distant; it is one third of a mile in width at the entrance, with 6 fathoms between the points; it runs to the E.S.E. for  $1\frac{1}{2}$  miles, and there is anchorage in 4 fathoms half a mile within; a half mile above this depth there is 9 feet at low water.

**Waipero Bay.**—A snug cove running to the south-west immediately inside the western entrance head of Parekura bay, where there is good anchorage in 15 feet at low water; the head of this cove is within half a mile of the eastern cove in Manawara bay, a high hill rising over the centre of the neck which divides them.

**Makiwi Cove.**—Outside Long point, the eastern entrance point of Parekura, this sandy cove runs to the eastward for half a mile; it is very shallow and unsheltered, and a reef of rocks lies off its entrance awash at half tide; they bear W.S.W. nearly a quarter of a mile from the north point of the cove, which is a clifty peninsula.

**Caution.**—**Albert Channel** should never be attempted unless with a leading wind; small vessels may enter it under the conditions before mentioned, and may frequently with advantage pass to sea through it, if, as is often the case, they have been waiting wind-bound at any of the neighbouring anchorages; but it should not be taken without a steady breeze, in consequence of the swell that would set in after a strong northerly or north-east wind, and never by large vessels, unless in cases of emergency.

Two high clifty islets, Round islet and Te Ao, lie off the south-west end of Orupukupuka, and two smaller ones with some rocks about them on the opposite shore; the bays within the latter to the eastward are shoal and rocky, and the islets must not be passed inside. These islets narrow the channel to a quarter of a mile in width, and a patch of foul ground, with 13 feet at low water lies to the southward of Round islet, in the centre of the passage; in the entrance between the south-east point of Orupukupuka island and the west point of Richards' peninsula is another small patch of 16 feet, which also lies exactly in the centre.

**Hope reef** lies from the western entrance point of the channel (the

south-east end of Orupukupuka island) N.  $\frac{1}{4}$  W. half a mile; this is a very dangerous reef; it is one cable in extent, awash at low water, and the sea breaks heavily on it in bad weather; there is a patch of 15 feet 2 cables to the eastward of it in the fairway of the channel, and another rock, which generally breaks, lies in a line between Hope reef and the Island point, 2 cables from the latter; immediately outside the reef there are 14 and 15 fathoms.

**Anchorage.**—In a small sandy bay on the south side of Orupukupuka, immediately within the channel, is good anchorage for small vessels in 12 and 14 feet at low water, well sheltered from northerly or westerly winds, but the point of the island must not be rounded very close in entering from the eastward, as some rocks extend a short distance from it.

**Richards peninsula** is nearly one mile in extent east and west, moderately high, with a steep rocky islet lying off each of its three points, to the eastward, westward, and northward; they are scarcely detached from the coast, which is rugged and sea-beaten:—this peninsula is connected with the main by a low sandy neck, about a hundred yards across.

**Caution.**—From here the coast curves to the N.N.E. for two miles to Deep water cove, which from seaward would appear to offer shelter to a vessel; the water, however, is too deep for anchorage until within less than half a cable of the shore in the north-east cove at its head. Coasters have availed themselves of this cove when not able to work round cape Brett; but the bank is very steep, and an anchor would be liable to drag; it is half a mile wide at the entrance, and runs east for the same distance, a small islet lying off each point.

**Twins rock**, 3 feet out of water, and about a hundred yards in circumference, lies one mile north of the northern entrance point of Deep water cove, and is 3 cables from the nearest part of the coast.

From Deep water cove to Piercy islet off cape Brett is N.E.  $\frac{1}{2}$  N.  $2\frac{1}{2}$  miles, the shore steep and cliffy, with a swell generally setting on it.

**Piercy islet** is a high bare rock about  $1\frac{1}{2}$  cables in extent; it is perforated with a remarkable archway, and has a small rock off its south-east end; the islet lies about a quarter of a mile N.N.E. of cape Brett, with deep water in the passage between. Small vessels sometimes run through, but unless with a fresh and fair wind, time would be lost by adopting it.

**Bird rock.**—This black rock, more than half a cable in extent and 2 or 3 feet high at high water, lies W. by S. a little more than one mile from Piercy islet, with 40 fathoms water close-to.

**CAPE BRETT.**—The summit of this cape is 1,220 feet above the sea, the highest land in the neighbourhood, and is one mile S. by E. of the

extreme point; it rises abruptly from the eastern side, but slopes gradually to the northward, rising again at the extreme point to a high round hillock.

The eastern approach to the Bay of Islands is equally remarkable as the western; the high land of cape Brett cannot fail to be recognized from a long distance on any bearing.

**Directions.**—Vessels bound to the bay from the southward, with a fair wind and clear weather, may round Piercy islet at the distance of half a mile in 40 fathoms water; the course then will be W.S.W. 7 miles, which will lead a quarter of a mile outside Bird rock, and nearly one mile outside the Whale rock; when the island channel between Red head and the islands westward of it is open, the Whale rock is passed, and a S.W. by S. course for  $4\frac{1}{2}$  miles will take a vessel mid-channel between Motu Roa island and Tapeka point: the directions already given for the harbour above these points will suffice.

Vessels arriving off cape Brett from the southward, with a south-west wind are recommended to stand direct across for cape Wiwiki and the Nine Pin, in preference to making short boards, as much smoother water will be found, and this wind frequently draws off the western shore and favours them, particularly towards the close of the day.

**Tides** within the Bay of Islands are not much felt, except at the narrow entrance of the rivers, where they run from 1 to  $2\frac{1}{2}$  knots per hour. In the Rawiti, one knot an hour is about their greatest strength, the flood running to the westward, and the ebb to the eastward.

It is high water full and change at Kororarika at 7h. 15m.; rise of tide from 6 to 9 feet.

#### FROM CAPE BRETT TO AUCKLAND HARBOUR.

The inshore course and distance from a berth 2 miles abreast Piercy islet, cape Brett, into the Hauraki Gulf is S.E.  $\frac{1}{2}$  S. 30 miles, which will lead  $3\frac{1}{2}$  miles off the Wide berth islands (south point of Wangaruru bay); inside the Poor Knights and Sugar Loaf rocks,  $3\frac{1}{2}$  miles from the latter, and will take a vessel abreast Tutukaka harbour, at a distance of about  $4\frac{1}{2}$  miles.

When abreast Tutukaka harbour, which will be known by three remarkable headlands called the three Gables, a course S. by E.  $\frac{1}{2}$  E. 23 miles, will lead midway between Bream Head (*Tewara*) and the Chicken group, and abreast the Sail rock (*Toutourou*).

The course is then S.E. for 25 miles to abreast Takatau point, 2 miles distant, having passed Rodney point within  $1\frac{1}{4}$  miles. If it is intended to pass outside Flat rock, which, when abreast Takatau point, will be 5 miles distant, the same course will lead 2 miles clear of it; if inside,

S. by E.  $\frac{1}{4}$  E. will be about a middle course between it and Kawau island one mile distant from either. A vessel passing inside the Flat rock will take the Wangaproa channel to Auckland harbour, which bears from the south-east end of Kawau island S.  $\frac{1}{4}$  E. 9 miles.

**Caution.**—In giving these inshore courses, it must be understood by the seaman that they are only intended for vessels passing down the coast under favourable circumstances, and when everything can be plainly made out; they are the courses usually adopted by coasters, and by those acquainted with the navigation, when running for the Hauraki gulf or Auckland harbour, with a fair wind.

**WANGAMOMOO HARBOUR.**—From cape Brett the coast trends S.  $\frac{1}{4}$  E. for 5 miles to the small harbour, Wangamomoo: the only danger between is a flat rock, 2 feet out of water, which lies  $1\frac{3}{4}$  miles south of Piercy islet, a quarter of a mile off shore.

Wangamomoo is the southern of two bays, somewhat similar in appearance when seen from seaward: the northern bay has several rocks scattered over it, and is without anchorage.

The north head of the harbour has an island lying directly east of it, and almost connected with the main; and to the south of this head close to is a high bare islet; neither of these, however, will be made out at any great distance. The southern head will be easily distinguished; it is the extreme of a high peninsula, which projects more than half a mile further to the eastward than to the north head.

The entrance is nearly half a mile wide, with 15 fathoms water; but to get secure anchorage a vessel must enter a small basin which runs to the south-west when  $1\frac{1}{2}$  miles within the north head point, and the entrance to which is not 2 cables wide: it is a snug anchorage for small vessels in 5 or 6 fathoms, but is not eligible for ships of large tonnage.

**COAST SOUTHWARD OF WANGAMOMOO.**—The peninsula which forms the southern side of Wangamomoo harbour, extends  $1\frac{1}{2}$  miles easterly from the main land, forming a bight on its southern side, which trends south-easterly to Home point, the northernmost point of Bland bay: this bight offers no shelter; there are some scattered rocks in its north-west corner, and a small islet lies S.  $\frac{1}{4}$  E.  $2\frac{1}{2}$  miles from the point of the peninsula, a quarter of a mile off the shore.

Home point lies S.E.,  $4\frac{1}{2}$  miles from the south head of Wangamomoo, it is a remarkable flat-topped point, and only connected with the main by a narrow neck: two cliffy islets lie south of this point, at distances of a half and three-quarters of a mile respectively: they are about one cable in extent, and the same distance off shore.

**BLAND BAY** is immediately to the westward of these islets; it runs in a westerly direction for  $1\frac{1}{2}$  miles, and has a long sandy beach on its south-

west side, which is the northern side of the neck, separating it from Wangaruru harbour; this neck is only 150 fathoms across. This bay is three-quarters of a mile wide at its entrance; but a line of rocky islets extend from its south side—a short distance within the head—in a northerly direction, more than half way across the bay; there are also two rocks in the centre of the entrance which break at low water, or when there is any swell; they bear from the southern rocky islet on the north side of the bay S.S.E. half a mile, and S.  $\frac{1}{2}$  E. 4 cable, leaving a passage north of them of only 2 cables.

**Caution.**—The only shelter which this bay would afford from easterly winds is to the westward of the line of rocky islets just mentioned, and here there is not more than 2 fathoms water, so that, although it has a somewhat inviting appearance in fine weather, it is useless as an anchorage, and a vessel should not stand in within the line of the heads.

**DANGER ROCK**, a black pinnacle rock standing 8 or 10 feet out of water, lies immediately off Bland bay, one mile from the coast; it bears from Home point, S.E.  $1\frac{1}{2}$  miles; and from the north entrance of Wangaruru harbour (cape Home) N.  $\frac{3}{4}$  E.  $2\frac{1}{2}$  miles; this rock is steep, and may be passed on either side, there being 24 fathoms within 2 cables.

From the south head of Bland bay to the entrance of Wangaruru harbour the coast is steep and bold, with no outlying dangers.

**WANGARURU HARBOUR\*** is S.S.E. 13 miles from cape Brett, and lies in the north-west corner of a bay 5 miles in length, of which cape Home is the north point, and the Wide Berth islands the southern limit; it is a good harbour for medium-sized vessels, well sheltered, and easy of access. It lies in a north-west and south-east direction, and is formed between the main land and the high peninsula which separates it from Bland bay.

**Henry island** lies in the entrance, and with the reef which extends off its southern extreme, affords considerable protection from easterly winds; it is not above 2 cables in extent, and a reef of rocks awash runs off its southern end in the same direction for nearly a quarter of a mile; the north end of this island bears from cape Home S.  $\frac{1}{2}$  W. 4 cables.

**Directions.**—Vessels may enter the harbour on either side of Henry island:—the passage to the northward is narrow, being a quarter of a mile in width, with a depth of 7 fathoms; after passing Henry island, the Black rocks will be seen on the starboard hand; they extend a quarter of a mile to the southward from Grove point, and the same distance off the land for half a mile to the eastward of that point, with 4 fathoms half a cable from their extreme. Passing to the northward of Henry island

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\* See Admiralty plan, No. 2,024; scale,  $m = 1.2$  inches, by Captain Stokes, R.N.

the mid-channel course will be W. by S., or a little to the right of Rugged point, a remarkable long, low rocky point, bearing from the centre of Henry island W. by S. nearly a mile; a large vessel should anchor in 6 fathoms, the centre of Henry island bearing east, distant a long half mile, and Grove point in a line with the extreme of the Black rocks N.N.W.  $\frac{1}{2}$  W.; the latter rocks will then be  $3\frac{1}{2}$  cables distant, and the extreme of Rugged point the same.

The passage south of Henry island however, is the widest and best:—vessels entering Wangaruru bay from the southward, after giving the Wide Berth islands a berth of  $1\frac{1}{2}$  miles, in 14 fathoms, should steer west, which will lead between Henry and Nops islands; the latter bears S. by W. from the former  $1\frac{1}{4}$  miles distant; is little more than a quarter of a mile long, and has two summits, which when abreast give it the appearance of two islands; they are connected, however, by a narrow neck of sand. When mid-channel between Henry and Nops islands, steer N.W.  $\frac{3}{4}$  N., or for Grove point, and anchor with the bearings already given.

**Caution.**—The reef which extends a quarter of a mile S. by W. from the south point of Henry island is awash; but vessels should not approach that point of the island within 3 cables, when they will have 9 fathoms water; if in 7 fathoms they are too close.

**Anchorage.**—There is a more sheltered anchorage than the one just described,  $1\frac{1}{4}$  miles above the Rugged point, but the channel to it is narrow for vessels of large draught, as a bank with 15 feet at low water extends nearly half a mile westward of Grove point. Vessels desiring this anchorage, and drawing more than 14 feet, should, after passing the Rugged point, steer to pass one cable outside the high islet which bears from Rugged point N.W.  $\frac{1}{2}$  W. half a mile, and is connected with the shore by a ledge dry at low water; when this islet bears south, one cable distant, steer N.N.W. or a little to the right of Hay island, which is  $1\frac{1}{2}$  miles distant. By observing these directions, a vessel will pass the narrows in 20 feet at low water, and almost immediately after passing the high islet the water will deepen to 4 fathoms; when abreast the northern end of Sandy bay (on the left hand), where there is a small native settlement, anchor in four fathoms, about 3 cables off the western shore, with Grove point bearing E.S.E.; the bottom here is mud.

Coasters drawing 8 feet may go  $1\frac{1}{2}$  miles above this, when the river narrows to a quarter of a mile, and is too shoal for anything but boats; the channel is to the southward of Hay island; the only danger is a rock with 4 feet water, which lies from the north point of the Settlement bay on the west shore N. by W. 2 cables, and from the south-west point of Hay island S.E. half a mile.

**Tides.**—It is high water, full and change, in Wangaruru harbour at 7h. 10m., springs rise 9 feet, neaps 7 feet.

**Anchorage.**—A snug and sheltered anchorage for vessels drawing from 10 to 12 feet, may be obtained half a mile northward of Grove point, and about 3 cables off shore, in 16 feet at low water; there is a native settlement in the first bay north of the point where supplies may be obtained from the natives; peaches and potatoes are in abundance.

**Water.**—Fresh water may be obtained from a stream in this bay, as well as from the Settlement bay on the opposite shore.

**Mimiwanca bay**, in the south-east corner of Wangaruru bay, is one mile in width at its entrance, and the same in depth. It lies S.E.  $\frac{1}{2}$  E. 4 miles from Henry island, and is open to the northward. Coasters bound to the southward make a stopping place of this bay with southerly winds; the best anchorage is with the east point of the bay, a cliffy point with three rocks off it, bearing north about 4 cables distant. On the east side is a long sandy beach, off the south-west point of which N.W.  $\frac{1}{4}$  N. a quarter of a mile, is a rock awash at low water.

**WIDE BERTH ISLANDS** are a cluster of high rocky islets lying in a N.N.E. and S.S.W. direction, and extending off the south head of Wangaruru bay; the outer or north-easternmost lies E. by N.  $\frac{3}{4}$  N. from the south head  $1\frac{1}{2}$  miles distant, and the inner one is a quarter of a mile from the shore. Three reefs awash lie one mile to the southward of these islands, and bear from the outer islet from S.S.E. to S.S.W., covering a space of more than half mile.

**Caution.**—These islands should generally be given a berth of 2 miles, unless with a commanding breeze, as there is a swell frequently setting on them, and the tides are liable to sweep a vessel too close in light winds and calms.

From Wide Berth islands to the north Gable, the coast trends S.E.  $\frac{1}{2}$  S. for nearly 11 miles; it is indented with several sandy bays, but without anchorages.

**ELIZABETH REEF**, on which a vessel of this name was wrecked, lies off this part of the coast; it is  $6\frac{3}{4}$  miles to the northward of the north head of Tutukaka harbour, and bears from the outer Wide Berth islet S.E.  $\frac{1}{2}$  S. 5 miles; it is half a mile in extent in every direction, and its outer edge lies one mile from the shore. The central part is awash at high water, and the sea always breaking on it; there is a narrow channel with 3 fathoms between it and the shore; 7 fathoms will be found close outside and 22 fathoms one mile distant from this reef.

**FOUR ISLETS** are nearly midway between the Wide Berth Islets and the Elizabeth reef, about a quarter of a mile off the coast, with 10 fathoms water one cable outside them:—the southern islet is high, and is the largest, being about a quarter of a mile in extent; it bears from Elizabeth reef N.W.  $\frac{3}{4}$  W. 2 miles, and from the outer Wide Berth islet S.S.E.  $\frac{1}{2}$  E. nearly 4 miles; the other three islets lie about a mile to the north-west.

**SANDY BAY** is immediately south of the Elizabeth reef; it is 3 miles in length and  $1\frac{1}{2}$  miles in depth; there are 6 and 8 fathoms water in it. A rock awash lies  $1\frac{1}{2}$  cables off the beach one mile to the southward of the north head; smooth water may be had in 6 fathoms, sheltered by the Elizabeth reef, and it would afford temporary anchorage for coasters in fine weather.

**THREE GABLES** are three remarkable gable-shaped headlands, lying in a N.N. W.  $\frac{1}{2}$  W. direction, nearly a mile apart from each other, having bays between, which are rocky and unsheltered; the southernmost gable forms the north head of Tutukaka harbour.

**TUTUKAKA HARBOUR\*** is 30 miles from cape Brett, and 13 miles from the south head of Wangarura bay; it bears from the southern Poor Knight island S.W.  $\frac{1}{2}$  S. 11 miles, and will be easily recognized by the three peculiar headlands just mentioned. It has always been a favourite coasting harbour, in consequence of its position with regard to the Non-godo river (being only  $1\frac{1}{2}$  miles to the northward), whence many of the native exports are derived; this river being difficult of access, owing to its intricate entrance, Tutukaka has been resorted to instead; a good native path connects the two, the distance being about three-quarters of a mile.

The North head of Tutukaka is nearly an island, being barely connected by a very narrow sandy neck, which the sea washes; what will appear as the south head in coming from the southward is also a cliffy islet, extending from the coast two cables, and almost joined to it by rocks:—this islet bears from the north head S. by E.  $\frac{1}{2}$  E. six-tenths of a mile, and has two rocks lying off it an E. by S.  $\frac{1}{2}$  S. direction; the outer rock is above water 2 cables from it; the inner rock breaks, and is mid-way between the outer one and the land, one cable from each; there are 3 and 4 fathoms water between these rocks; another rock which breaks lies S. by W.  $\frac{1}{4}$  W. from the south head islet, distant  $2\frac{1}{2}$  cables.

The true South head of the harbour lies W.N.W. half a mile from the above islet, and from it a cluster of rocks extends above water towards the north head for a quarter of a mile, the largest rock being well out of water and one cable in extent. Between this rock and the north head is the passage in; it is just one cable wide, and, when inside opens out to two cables.

**Anchorage.**—The anchorage is 2 cables inside the rock in  $4\frac{1}{2}$  or 5 fathoms; a vessel will then be a quarter of a mile from Philipps island, a high wooded islet which lies in the centre of the harbour, and distant W. by S. half a mile from the entrance rock. From Philipps

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\* See Admiralty plan Tutukaka harbour and Mongodo river, No. 1,275; scale,  $m=3\cdot0$  inches.



island the harbour branches off into two arms; they are both shallow, and end in sandy beaches; one runs to the W.N.W. for half a mile, and the other S. by W. for somewhat less. There will be found 15 feet at low water one cable from Philipps island.

**Tides.**—It is high water full and change, in Tutukaka harbour at 7h. Om. rise, springs 9 feet, neaps 7 feet.

Tutukaka harbour, it will be seen, is only fit for small vessels, though H.M.S. *Buffalo* when waiting here for Kauri spars from the Nongodo river, lay for some time moored head and stern, which vessels of large tonnage must do. The rocks at the entrance afford good shelter from easterly winds; there is a boat channel with 9 feet water between them to the southward. The only directions which seem necessary for entering the harbour are, to avoid the reefs which lie off the South head islet, by giving it a berth of half a mile, and to make for the North head, passing in between it and the entrance rock: there are 5 fathoms close to the former, 7 to the latter, and 8 in mid-channel.

**NONGODO RIVER**\* lies in the north-west corner of a sandy bay  $1\frac{1}{2}$  miles, to the southward of Tutukaka. In this bay there is a good anchorage with off-shore winds in 6 and 7 fathoms, sandy bottom; the river can only be entered in fine weather by coasters acquainted with the locality; it is very narrow, with a rock in the entrance, and carries a depth of 5 feet at low water for a distance of 4 miles within the mouth. Kauri spars have been procured from forests in the neighbourhood of this river, and there are still some to be had.

The bay trends 4 miles in a S.E. by S. direction from Nongodo river, and terminates in a projecting point with a small islet lying close off it, which may be passed close in 16 fathoms. W.N.W. nearly a mile from this point is a rock awash, 2 cables' lengths off shore.

**Bream head.**—From the projecting point, the coast trends S.S.E.  $8\frac{1}{2}$  miles to Bream head (*Tewara*) and is almost straight; for a distance of 4 miles the land is moderately high with a cliffy coast, which terminates abruptly in a round hill, and is succeeded by the low land of the Wangari peninsula, the coast being fringed with sand-hills to the neighbourhood of the cape, when the high and rugged land of Bream head immediately over it, and the neighbouring hills fronting its southern face, rise to a height of 1,500 feet.

**Bream Islet**, about 2 cables in extent, lies north from the cape nearly one mile; there are also three rocky ledges at a distance of one and two miles from it; from 18 to 20 fathoms will be found one mile from the shore.

**Bream Rock**, on which the sea breaks in heavy weather, lies N.E. by E. distant three quarters of a mile from Bream islet; it is about 33 yards in

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\* See Admiralty plan, Tutukaka harbour and Nongodo river, No. 1,275; scale,  $m=3\cdot0$  inches.

diameter, and has 16 feet water on it. This is a dangerous patch for vessels working to southward, or rounding Bream head for Wangari harbour.

**WANGARI BAY.**—Bream head is the north point of Wangari bay : it is 42 miles, S.S.E.  $\frac{3}{4}$  E. from cape Brett, nearly 16 miles from the north head of Tutukaka harbour, and W. by N. 5 miles from the west or nearest Chicken islet. S. by E. from it 11 miles is the Bream tail, (*Papai Outou*,) a bluff of moderate height, and the southern limit of the bay, which is 7 miles in depth, running in an uniform curve to the westward, with a sandy beach of 10 miles in extent.

At a distance of 2 miles from this beach there is anchorage with westerly winds ranging from north to south, in 5 and 6 fathoms, sand bottom, except within two miles of its north-west extreme, or the sandy west point of Wangari harbour, off which extends a sand-flat (Mare bank), which will be noticed hereafter.

**WANGARI HARBOUR.\***—From Bream head the coast runs in a W. by S. direction towards the harbour, and is steep, with a continuation of the Bream head mountain range rising abruptly from the sea almost to the same height for a distance of 3 miles, when it terminates in Busby head, the east point of the harbour ; to the eastward of Busby head a bight runs in for half a mile, which is shoal, and should be avoided ; off the west pitch of Busby head is a steep sugar-loaf cone, connected with it by a ledge ; this may be considered the entrance point.

**Anchorage.**—The coast from this turns directly north ; and at a distance of half a mile is Home point, with a hill about 200 feet high over it ; round this point, in Calliope bay, is the first anchorage, and a vessel should only shoot round it sufficiently far for protection from a south-east swell, or about a quarter of a mile and  $1\frac{1}{2}$  cables from the shore, as the distance from it to the Calliope bank is scarcely 3 cables : this is only a small vessel anchorage.

**Calliope Bank** is an extensive sand flat extending from Lort point, the northern entrance point of the river, in a sweep, to within 3 cables of Home point, and covering the whole of the bay, eastward of it, with the exception of a very narrow channel in shore for coasters ; there is scarcely 2 feet on this bank at low water.†

**Mare Bank.**—The western portion of Wangari harbour, which is on

\* See Admiralty plan, Wangari harbour No. 2,047 ; scale,  $m=3\cdot0$  inches, by Captain Stokes, R.N., 1849.

On the north side of Wangari harbour, in Parua bay, is the cape Breton settlement, and higher up, opposite Limestone island, is Mangapai. The village of Wangari, or Whangarei, is 17 miles inside the heads, and the centre of one of the most fertile districts in the province. There is also abundance of coal, limestone, iron, building stone, &c. in the district.—From New Zealand Almanac, 1874.

† H.M.S. *Calliope*, in entering Wangari harbour for shelter from a S.E. gale, ran on this bank from not knowing the channel.

rounding Sandy point bordered with sandy hillocks from 15 to 20 feet high, bears from the Sugar-loaf N.W. by W.  $\frac{1}{2}$  W. 2 miles: from this point the Mare bank extends, sweeping round to the east and south-east approaching within 4 cables of Home point, and thence to the southward.

The channel is thus formed, until abreast of Home point, by the Mare bank on the left and the main land on the right, and 4 cables is its extreme width. When above Home point, Mare bank still continues the left-hand boundary, and the Calliope bank becomes right, the channel narrowing to little more than 3 cables, until abreast of the Passage islet, a small wooded islet, which lies close off Lort point.

**Anchorage.**—W.N.W. from this islet, nearly half a mile, is the second or Passage islet anchorage.

N. by W. three-quarters of a mile from Home point is a small islet; it lies on the Calliope bank, a quarter of a mile to the northward of its southern edge. N.N.W.  $\frac{1}{2}$  W. from the same point  $1\frac{1}{2}$  miles distant, and close to the north shore of Calliope bay, is another higher and larger islet, which is used as a leading mark for the channel.

As vessels forced into Wangari harbour by stress of weather would seek either of the two anchorages just mentioned for shelter, it seems desirable, before noticing the upper part of the river, to give concise directions for passing through the narrows which lead to them.

**Directions.**—Vessels entering Wangari under such circumstances should be prepared to shorten sail, and anchor without delay, as the tides are strong, and running in with a fair gale of wind there is not much room for rounding to; a look-out from aloft is also desirable in a large vessel, as the edges of the banks will generally be easily distinguished.

To enter Wangari from the northward or eastward, and after rounding or passing Bream head extreme, the mountain (Bream head) should be brought to bear N. by W., keeping half a mile off the shore; when this bearing is on, steer W. by S., or parallel with the coast, for 2 miles: the Sugar loaf off the west point of Busby head will then bear N.W. by W.  $\frac{1}{2}$  W., and the western sandy entrance point will be just open of it; observing that in approaching Wangari on this course, the Sugar-loaf will not appear as detached from Busby head until the above marks are nearly on.

When the above marks are on, steer immediately W. by N.  $\frac{3}{4}$  N. for nearly one mile, which will lead abreast the Sugar loaf, and 2 cables from it; when abreast it at this distance, alter course to N.N.W.  $\frac{1}{2}$  W., or for the left extreme of the high islet on the north shore of Calliope bay; little more than half a mile on this course will be abreast and 2 cables from Home point.

If the first anchorage is desired, haul close round this point, proceeding to the eastward a quarter of a mile, and anchor in 4 fathoms,  $1\frac{1}{2}$  cables

or less from the shore : here a vessel will be almost out of the tide and in safety.

If the second anchorage is preferred, (and which is recommended for vessels of large size,) when abreast Home point and about two cables off it, steer N.W. by N., or one point to the left of High islet on the north side of Calliope bay, for one mile; or until the sand hillock on the western sandy entrance point bears W. by S.  $\frac{1}{2}$  S., or High islet centre N.  $\frac{1}{4}$  W.; then alter course to W. by N. to pass one cable's length to the southward, or on the port hand of Passage islet in 13 fathoms;—anchor N.W. by W. from the centre of the islet, 4 cables distant from it in  $5\frac{1}{2}$  fathoms: a vessel will then be a quarter of a mile from the shore, and the same distance from the nearest part of the Snake bank, or Middle ground.

**Soundings.**—By following the above directions a patch of  $4\frac{1}{2}$  fathoms will be passed over, E.S.E., one mile from Busby head; from thence mid-channel to abreast the Sugar-loaf, from 6 to 9 fathoms will be carried. From the Sugar-loaf to abreast Sandy point, 10, 12, and in some places 14 fathoms. From thence to Passage islet from 8 to 9, and close to the islet 13, when it immediately shoals towards the anchorage to 7 and 5 fathoms over sand and mud.

**Tides.**—It is high water full and change in Wangari harbour at the lower anchorages at 7h. 0m.; the rise from 7 to 9 feet. The tides run 3 knots.

**Caution.**—The banks of the channel are rather steep; and if a vessel gets into 4 fathoms on either side, she is too close. Vessels bound to Wangari from the southward should not steer inside a line from Bream tail to the Sugar-loaf, or if the latter cannot be seen, the high hill eastward between it and Bream head, until within the proper distance of that land, for entering the channel.

**Directions.**—In working up Wangari bay to the northward, for the harbour, an isolated round hill will be immediately seen, rising out of the low land on the south side of Wangari; this hill is one mile from the beach, and bears from the western entrance (Sandy point), S.W. by S.  $3\frac{1}{2}$  miles. To avoid the Mare bank; as soon as this hill is brought to bear W. by S., vessels must not stand in so far as to bring the Sugar-loaf to the eastward of N.N.E. Round the north side of the hill just mentioned winds a rapid stream which empties itself into Wangari bay about 4 miles from the sandy point; boats may enter, and it deepens considerably inside.

**Wangari river.**—The passage between Lort point and the western sandy point is half a mile wide, and may be considered the entrance of the Wangari river: above these points it opens out to a width of 2 miles; the south shore is low and swampy, while the north is overlooked by hills of considerable height.

There is a channel of  $3\frac{1}{2}$  fathoms at low water as far up as Limestone island, a distance of 8 miles; and it preserves an average width of nearly a quarter of a mile: with the exception of this channel the water is shoal, with numerous flats dry or nearly so at low water. To make the river generally available for vessels of large tonnage, it would require to be buoyed in several places; but with care and attention to the chart, anchorage as high up as Single tree point may be obtained without any other aid.

**Single Tree Point** is a flat clay cliffy-looking point about 20 feet high, with a solitary tree on its extreme, which will be seen at a long distance, there being no others in the vicinity; it bears from Sandy point W. by N.  $\frac{1}{2}$  N.  $2\frac{3}{4}$  miles. To the south-eastward of Single tree is another point of the same nature, but lower (Sinclair point), it is the commencement of the line of clay cliffs, and bears W.  $\frac{3}{4}$  N. from Sandy point nearly  $1\frac{3}{4}$  miles; the channel, as far as Single tree point, lies on the south shore at a distance of about half a mile from it, and between it and the Snake bank.

**Snake Bank** extends from a little above Passage islet anchorage in a north-west direction nearly three miles; this bank is covered at high water, except a serpentine spit, always dry, and bearing from Passage islet W.N.W.  $1\frac{1}{2}$  miles. Vessels bound up the river without anchoring should pass exactly mid-way between Passage islet and Sandy point, where the water is very deep (one cast of 20 fathoms).

When the centre of the islet bears N. by W.  $\frac{1}{2}$  W. steer directly for the tree on Single tree point W.  $\frac{3}{4}$  N. for  $1\frac{3}{4}$  miles, carrying 4 fathoms; Sinclair point will then bear S.W. by S., when steer N.W. by W.  $\frac{1}{4}$  W., or a little to the left of the high land over Annoyance point (exactly for the left extreme of the point), for one mile, in from 5 to 7 fathoms, when the Single tree will bear S.W. nearly half a mile, and a vessel may anchor in 5 fathoms mid-channel; above this the southern coast recedes, and becomes very low and swampy, with mangrove bushes.

From Single tree point the channel contracts for some distance to less than 2 cables, and no natural marks sufficiently accurate to lead a vessel through can be given. The line of shoal water may often be distinguished by the discolouration and by the tide line; these indications and the lead will be the best guide until the river is buoyed. The general course, from the position given off Single tree point, is W. by N. for  $2\frac{3}{4}$  miles, leading rather towards the northern shore in from 3 to  $3\frac{1}{2}$  fathoms; when this distance is run, or the high land over the right extreme of Annoyance point bears N.E. by E.  $\frac{3}{4}$  E., steer N.W. by W.  $\frac{1}{2}$  W. for two miles, or until a remarkable shoulder sloping to the north-west (the termination of the high land on the north shore) bears N.E. by E.  $\frac{1}{2}$  E.; a course may then be steered mid-channel between the river point and the north point

of Limestone island. Coasters go some miles above this at high water, and the country is one of the finest in New Zealand; there are several farms on the river banks.

There is a large but shallow bay on the north side of the channel, Maori bay; its entrance is N. by W.  $1\frac{1}{2}$  miles from Single tree point; this bay is only fit for coasters, as the middle ground must be crossed from Single tree in 9 feet, and at low water the anchorage within does not exceed that depth; on its shores the natives have some small cultivations.

**Water.**—Fresh water may be obtained at either of the lower anchorages; at the first, in Calliope bay, there is a small river half a mile above the anchorage, where it can be got with much facility: at the Passage islet anchorage, there is a stream running through a stony beach abreast the anchorage.

**Waipu** is a river about 4 miles south of Wangari harbour; inland about 2 miles it spreads into four branches, each navigable for small vessels 2 or 3 miles, there is a bar entrance but vessels enter with perfect safety.

**Mackenzie Cove** is outside Waipu river, where the anchorage is safe with north and north-east winds. Passengers, cattle, &c., are landed here; the distance to Wangari is 12 miles, and to Auckland about 60 miles.

**McGregor Rock.**—This is a sunken rock, that lies nearly midway between Tautorou rock and Bream tail: it has 11 feet water on it, and from it Bream island bears N.N.W.  $\frac{1}{2}$  W. (northerly), and Tautorou rock N.E.  $\frac{1}{2}$  E. distant  $2\frac{3}{4}$  miles.

**BREAM TAIL to RODNEY POINT.**—From Bream tail the coast trends S.E.  $\frac{3}{4}$  E. to Rodney point, 19 miles:—it is almost straight with long sandy beaches; the land is not high, but slopes gradually from a continuation of the Bream tail range to the beach. In the neighbourhood of Rodney point the coast is more hilly. Mount Hamilton, a remarkable wooded eminence with a double summit, rises to a height of 1,300 feet, 6 miles to the westward of it.

**Soundings.**—The soundings off this part of the coast are regular, 30 fathoms 5 miles off the land, and shoaling gradually to 6 fathoms within half a mile. Rodney point is a bold cliffy point, not high itself, though high land rises at the back; it may be passed close.

**Mangawai.**—About  $2\frac{1}{2}$  miles south of Bream tail is Mangawai, it has a narrow bar entrance, which is not practicable during easterly winds, and is poled off to guide coasters to the landing-place, 4 miles from the entrance. This is the nearest harbour on the east coast to the heads of the Otamatea and Oruawharu, branches of the Kaipara river.

**LITTLE OMA COVE.**—One mile south of Rodney point is Little Oma cove, a double-headed creek, where coasters frequently find a stopping

place in north-west winds ; there is a reef above water off its north point ; the anchorage is in 5 fathoms, a quarter of a mile from the beach.

**TAKATAU POINT.**—The first projecting point south of Rodney point is Takatau ; it bears from the former S.E.  $\frac{3}{4}$  S. 6 miles : Takatau point is a long remarkable looking point, with several cone-shaped rocks standing on its extreme.

**GREAT OMA BAY.**—Midway between the two is Great Oma bay, horseshoe shaped, and 3 miles in depth ; there is anchorage in it with off-shore winds in 5 to 9 fathoms, but it is exposed to easterly winds, when a heavy swell rolls in.

**KAWAU ISLAND.\***—Southward of Takatau point  $1\frac{3}{4}$  miles, is Kawau island,  $3\frac{1}{2}$  miles in extent from north to south, and about the same from east to west. It is hilly and well wooded, its average height varying between 500 and 600 feet ; on the west side is Bon Accord harbour, with good anchorage for the largest vessels ; immediately north of this harbour is the north cove, an anchorage for small vessels.†

To the westward of Kawau island is an extensive inlet, known as Kawau bay : it extends westward for 4 miles, and is about the same extent in a north and south direction ; it has a depth of from 4 to 6 fathoms in almost every part, and in the north-west corner is the river Mata Kana, which is navigable for coasters.

**Channels.**—There are three channels to Bon Accord harbour and Kawau bay, viz. :—the north, south, and inner channels. The north channel lies between Takatau point and the north shores of Kawau island, the south channel is between the south side of that island and the Kaitu-kala islands ; the inner channel, which is convenient for vessels from Auckland or from the southward, and the easiest for navigation, is inside the islands Ora and Kaitu-kala, or between them and the mainland.

**North Channel,** which is recommended for a vessel from the northward with a leading wind, or indeed with any wind but a strong westerly one, has the following dangers :

**Maori Rock,** awash at low water, a cable in extent, and lies S. by W. nine-tenths of a mile from Takatau point.

**Fairchild Reef,** a large flat rock awash at high water, bearing from Takatau point south  $1\frac{1}{2}$  miles, and from Kawiti point, the north point of Kawau island E.  $\frac{1}{2}$  N. nearly one mile ; this rock is a quarter of a mile from

\* See Admiralty plan, Kawau island, No. 1,998 ; scale,  $m = 2.7$  inches, by Captain Stokes, R.N., 1849.

† The island is now entirely owned by Sir George Grey, K.C.B., who has built a handsome mansion on the shores of Fontelaye bay, and is rapidly cultivating and improving his property. The island has been stocked with wild cattle, sheep, elk, deer, kangaroo, and various sorts of birds ; every rare plant that will live at Madeira flourishes at Kawau, the climate of which island being similar to that of St. Michael's, in the Azores.—From Remarks of Captain Palmer, H.M.S. *Rosario*, 1868.

the Kawau shore, and can scarcely be called a danger, being always visible and out of the usual track of vessels.

**Sunk Kelp**, a shoal of 8 feet at low water, bearing west three cables from Kawiti point, and the Iris shoal, which is six cables in extent, and on its shoalest part has 20 feet from which Kawiti point bears N.E. by E. nearly  $1\frac{1}{2}$  miles, and Pemples islet S.E. by E.  $\frac{1}{2}$  E.  $\frac{1}{2}$  one mile, with a deep water channel between.

**Directions.**—These dangers may be avoided by attending to the following directions; but in working through the north channel it must be remembered that a tide of more than three knots runs there at the springs:—The passage between Maori rock and Fairchild reef on the Kawau shore is the best, there being a clear distance of more than half a mile between.

The passage north, or inshore of Maori rock, is barely one cable wide, and should not be used unless under favourable circumstances, or by those acquainted with the channel, and when the rock is visible; but if adopted, the points on the north shore should be given a berth of a quarter of a mile, as sunken rocks extend off some distance; there are also two patches with 13 feet on them, immediately in the fairway, and bearing from the Maori rock S.W. by W.  $\frac{1}{2}$  W. and S.W. respectively; the former  $3\frac{1}{4}$  cables, the latter  $2\frac{1}{2}$  cables distant; Maori rock must in this case be passed within  $1\frac{1}{2}$  cables' lengths.

**Vessels coming from the northward** or eastward with a leading wind, and taking the wider and better channel, should pass Takatau point at a distance of about half a mile; when abreast this point, if Maori rock is covered, steer S. by W.  $1\frac{1}{4}$  miles, or until Kawiti point bears S.W. by W.  $\frac{3}{4}$  W. Maori rock will then bear N.W. by W.  $\frac{1}{4}$  W., nearly half a mile distant; from this steer W. by S.  $1\frac{3}{4}$  miles, or until Pemples islet, which lies close off the north point of North cove, is in a line with the westernmost point of Kawau island, which is half a mile to the southward of Pemples islet:—Kawiti point will then bear E. by S.  $\frac{3}{4}$  S. half a mile distant, and a vessel will be well clear of the shoal off it; a course may now be steered S. by W., (which will clear the north-east end of the Iris shoal where there are  $4\frac{1}{4}$  fathoms, and leave the shoal patch of 20 feet, 3 cables on the starboard hand,) to pass outside Pemples islet 2 cables' lengths, and when the entrance to Bon Accord harbour, which is one mile southward of the islet opens out, haul in and anchor in mid-channel, abreast the second bay on the south side, in  $4\frac{1}{2}$  fathoms.

In entering the north channel when Maori rock is seen in passing Takatau point, a course may be steered to pass outside it about 3 cables; and when the rock bears N.W. by N., at that distance, steer as before directed, W. by S., and observe the same marks for clearing the shoal off Kawiti point and entering Bon Accord harbour.



A good mark for Maori rock is the northernmost Mayne island in a line with Kawiti point, which leads directly on it; and vessels passing in or out of this channel may be certain that when Mayne island is not open of Kawiti point, they are to the southward of the rock.

**BON ACCORD HARBOUR** lies about the centre of the west side of Kawau island; it runs in an east and west direction for  $1\frac{1}{4}$  miles, and is three quarters of a mile wide at its entrance; half a mile inside its entrance (which is as far as a large vessel should go) it is half a mile wide. There are several bays on its south shore; in Momona, the outer bay, small vessels anchor but must not remain with a fresh wind from northward or westward; the best anchorage is in mid-channel abreast the second bay, with the north entrance point bearing W. by N.  $\frac{1}{4}$  N. half a mile distant, and Momona point in line with the western point of the second bay.

**Water.**—In a bay on the north side of the harbour, abreast this anchorage, fresh water may be obtained with much facility.

**Smelting Cove**, on the north shore of Bon Accord harbour, is a mile from the north head; good anchorage in 3 fathoms may be had off its west sandy point; there was a large smelting establishment in this cove, built with stone brought from the Mata Kana river quarries.

**MARTELLO ROCK.**—S.W.  $\frac{3}{4}$  W. from Momona point—the southern head of Bon Accord harbour—nearly half a mile distant, is the Martello rock, so called from its resemblance to a Martello tower; it is surrounded by a reef, extending in a north and south direction  $1\frac{1}{2}$  cables, but there is a good passage between it and Kawau island of more than a quarter of a mile.

**MAYNE ISLANDS.**—Directly off the mouth of Bon Accord harbour westward, at a distance of  $1\frac{1}{4}$  miles, are the Mayne islands, two small islands lying in a N.N.W. and S.S.E. direction, and half a mile apart, with a reef lying between.

**ECLIPSE SHOAL** lies between the Mayne islands and the entrance to Bon Accord harbour. The shoal is nearly circular, about three quarters of a cable in extent with  $2\frac{1}{4}$  fathoms of water on it. The middle of the north Mayne island bears W. by S.  $\frac{1}{4}$  S. distant about 4 cables from it, and Fish point is just shut in with the south Mayne island.

**North Cove** is half a mile to the northward of Bon Accord harbour; it is a quarter of a mile wide at its entrance, and anchorage may be had in  $3\frac{1}{2}$  fathoms, at that distance inside the heads: a reef of rocks awash lies  $1\frac{1}{2}$  cables north of its southern entrance point. Much sea sets into this cove with westerly winds.

**Dispute Cove** is a small cove on the south side of Kawau island, one

mile to the south east of Bon Accord harbour, it is without shelter with westerly or north-westerly winds.\* The copper mines formerly in this cove have ceased to be worked.

The southern side of Kawau island may be passed within less than half a mile in 14 fathoms; there is a bay near the south-east extreme, where a vessel may anchor with northerly winds: two small steep islets lie one cable to the southward of the south-east point of the island (Kawau point), with a boat passage inside them.

The eastern side of Kawau island is a steep and bold cliffy shore, and may be approached within a quarter of a mile, in from 12 to 15 fathoms, the only danger is the Nelson rock.

**Nelson Rock** with 9 feet water on it at low springs, and 5 to 10 fathoms close to, lies between Flat rock and Kawau island, and is 4 cables from the shore of Kawau with the south-east point of that island S. by W.  $\frac{3}{4}$  W.; Flat rock E.  $\frac{1}{4}$  S.; Tiri Tiri lighthouse S. by E.  $\frac{1}{2}$  E.; and Takatau point N.W. by N.

**FLAT ROCK.**—E. by N.  $\frac{1}{2}$  N. from Kawau point, two miles distant, lies the Flat rock which has been already described (p. 18).

**Tides.**—It is high water at Bon Accord harbour on full and change days at 6h. 30m.;—rise from 7 to 10 feet. The flood tide runs to the westward through the north channel, sweeping round Kawau bay, and down to the southward; on the east side of Kawau island the flood runs to the southward and with considerable strength near the south-east extreme. The ebb runs to the northward on both sides of the island, and out to the eastward through the north channel, at the rate of  $3\frac{1}{4}$  knots during springs. In the southern and inshore channels their velocity is from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  knots.

**South Channel.**—The Keitu-kala islands, between which and Kawau island is the south passage, are two small islands, each little more than half a mile in extent; they are bare of trees, moderately high, and have a passage of  $1\frac{1}{2}$  cables wide between them, with 9 and 10 fathoms. Their northern end bears from the south-east point of Kawau S.W.  $\frac{3}{4}$  W.  $3\frac{1}{2}$  miles, and from Wagna point, the northern point of Wangaproua peninsula, N. by W.  $\frac{3}{4}$  W.  $7\frac{1}{4}$  miles. The impediments to navigation in this channel are, the Beehive islet and reef, Passage reef, and Albert shoal.

**The Beehive.**—The Beehive is a remarkable cone-shaped islet, with a white sandy beach round its base; it is surrounded by a reef, 3 cables from east to west, and one from north to south, and lies between Kaitu-kala islands and the south point of Kawau, N.  $\frac{1}{4}$  E., one mile from the former, and S.W.  $\frac{3}{4}$  W. six-tenths of a mile from the latter; it may be

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\* See Admiralty charts, New Zealand, sheet 2, No. 2,543; Kawau island, No. 1,998.

passed on either side. The clear passage, between it and Kawau island, is 3 cables wide, with not less than  $4\frac{1}{2}$  fathoms water.

**Directions.**—If this passage is taken, a vessel should steer in direct mid-channel between Beehive islet and the point of Kawau island, as a reef extends one cable south of the latter point. Immediately on passing the Beehive, the water deepens to 6 fathoms, and a direct course may be shaped for the Martello rock, bearing N.W. by W. distant  $1\frac{1}{2}$  miles; when within a convenient distance of the latter, pass either outside or between it and Momona point, and enter Bon Accord harbour as before directed.

The projecting point, two cables south of Momona point, has two peaked rocks lying close off it, which will be a good mark from the southward.

**Passage Reef.**—The passage between Beehive islet and Kaitu-kala islands is divided by the Passage reef, a cluster of rocks half a cable in extent and dry at low water, which lie nearly in the centre of it. The passage to the southward of this reef is the widest and deepest; that to the northward should not be taken unless the rocks are seen awash; the course will then be in mid-channel, between them and the Beehive in 4 fathoms, and when they are past, West, until the marks are on for clearing the Albert shoal. Passage reef bears from the north end of Kaitu-kala island N. by E.  $\frac{1}{2}$  E. more than half a mile, and from Beehive S. by E.  $\frac{1}{2}$  E.  $3\frac{1}{2}$  cables.

**Directions.**—The passage between Kaitu-kala islands and Passage reef is more than half a mile wide, with 8 and 9 fathoms, and is preferable for large ships to those just described. Vessels from the eastward or northward, intending to take it, after passing the south-east end of the Kawau island, should steer for the northern end of Kaitu-kala islands until within half a mile of it, or until the summit of Fish point (the southern point of Kawau bay) bears W. by N.  $\frac{1}{2}$  N., when a course should be steered for that point to pass to the southward of the Albert shoal, passing about 3 cables from the north end of Kaitu-kala, or nearer if convenient. When the Martello rock bears N. by E.  $\frac{1}{4}$  E. a vessel is to the westward of Albert shoal, and may steer direct for that rock; on this course, and when the Beehive bears E. by S., there are 9 fathoms water, and the shoal will lie on the same bearing, about 3 cables distant; and when the Beehive bears E.S.E., a vessel will be well clear to the northward of it, and may pass either inside the Martello rock, or between it and the southern Mayne island, which latter is a channel of more than half a mile wide, with 10 and 11 fathoms. An excellent mark for clearing the Albert shoal, and one which cannot fail to be recognized, is the Martello rock in a line with a remarkable drop in the coast to the northward (the neck of the Takatau peninsula), bearing a little to the eastward of north, which will lead to the westward of the shoal nearly a quarter of a mile, and a

vessel intending to pass to the westward of it must on no account haul up for Bon Accord harbour until the Martello rock is brought on or to the eastward of this mark.

**ALBERT SHOAL** is 2 cables in extent, and on its shoalest part has 9 feet at low water; it lies in a direct line between the Beehive islet and the north extreme of Fish point, and bears

From Beehive islet	-	-	W. by N.	nine-tenths miles.
From Martello rock	-	-	S. $\frac{3}{4}$ E.	nine-tenths miles.
South point Bon Accord harbour,				
(two peaked rocks)	-	-	S. by W. $\frac{1}{2}$ W.	one mile.

If it is intended to pass to the eastward of the Albert shoal, between it and Beehive islet, the channel is more than half a mile broad, and the least water  $3\frac{1}{2}$  fathoms. After passing Passage reef, and bringing the north end of Kaitu-kala to bear S. by E.  $\frac{1}{2}$  E., steer for Momona point or on a course between it and the Martello rock, for the harbour; this will lead clear to the eastward of the shoal more than a quarter of a mile.

**ORA ISLAND** lies S.S.W., one mile from the south Kaitu-kala: its south-west point bears from Wanga point N.W.  $\frac{1}{4}$  N.  $5\frac{1}{2}$  miles, and from the entrance of Maurhangi harbour E.  $\frac{1}{4}$  N.  $2\frac{1}{2}$  miles; it is  $1\frac{1}{2}$  miles long, about 300 feet high, and lies in a north-west and south-east direction, with some rocky patches extending off its north-east and east points nearly a cable.

**Inner Channel.**—Between Ora and the Kaitu-kala islands and the main land is the inshore channel to Bon Accord harbour and Kawau bay; and for vessels coming from the southward through the Wangaproa channel, it is the easiest and most convenient, particularly with a working wind, as from the south point of Ora island to Fish point there is a clear working channel of  $1\frac{1}{2}$  miles wide, with from 7 to 9 fathoms.

In working from the southward, vessels may pass between Ora island and the south Kaitu-kala, if convenient, there being deep water, and a channel of nearly a mile in width; but the Blanche passage between the Kaitu-kala islands should not be taken, unless with the wind directly through.

**KAWAU BAY.**—With the exception of the reefs between the Mayne islands, there are no dangers in this bay; outside a line from Fish point, to Mata Kana river there is a general depth of from 4 to 7 fathoms over sandy bottom: inside this line the water shoals to 3 and 2 fathoms, except in the bay immediately to the westward of Fish point, where there is snug anchorage in 4 and 5 fathoms, with southerly winds. Coasters alone may pass between the Mayne islands; there is a reef in the centre of the passage, and another nearly joining it, extending from the north end of the south island, leaving a passage between of half a cable broad, with

2 fathoms. There is a wider passage between the middle reef and the north island; these reefs and the deepest channels will be seen at low water.

**MAURHANGI HARBOUR\* and RIVER.**—The next harbour southward of Bon Accord, and 6 miles distant from it, is Maurhangi, on the main land. The entrance may be known by the small saddle-shaped island, Whora, which lies a little more than half a mile distant from it; this, and Ora island, afford good protection to the harbour from easterly winds.

**Whora island** lies N.W. by W.  $6\frac{1}{2}$  miles from the extreme of the Wangapoa peninsula, and W. by S.  $1\frac{1}{2}$  miles from the south end of Ora island. Vessels bound to Maurhangi should steer to the southward of both these islands, and passing the south end of Whora, within a quarter of a mile, a course should be steered direct in between the heads.

The south head is wooded, and has a small conical islet (*Kiahou*) lying 2 cables north of it, connected by a reef; shoal water extends half a cable off this islet.

The north head, Sadler point, a steep green point without trees, should not be approached nearer than one cable, as a shallow sandy spit extends from it; the clear channel between the heads is little more than half a mile in width, with from 5 to 8 fathoms water.

**Caution.**—Strangers entering Maurhangi harbour are liable to mistake the arm which runs immediately north from Sadler point for the main harbour: there is shoal water, however, in this arm a short distance within the line of the points.

**Directions.**—The direct course up is N.W.  $\frac{1}{2}$  W. for the peninsula of Manga Nui, which is high, and makes as an island; it bears N.W.  $\frac{1}{2}$  W. from the north head, distant  $1\frac{1}{2}$  miles; between this peninsula and the south shore is the best anchorage for large vessels, with the centre of Manga Nui bearing N. by E., in 7 fathoms muddy bottom; the channel here is scarcely half a mile wide. Westward of Manga Nui is another arm, running to the N.N.W., with shoal water a short distance within its entrance points.

**Anchorage.**—There is anchorage in 5 fathoms three-quarters of a mile above Manga Nui; immediately above this anchorage it shoals, with flats drying at low water; boats can ascend the river several miles with the tide.

Kauri forests existed near the head of the river; H.M.S. *Buffalo* procured many spars from them.

There is a narrow passage into Maurhangi harbour from the northward between Whora island and the main; a reef of rocks extends off the

\* See Admiralty plan, Maurhangi harbour, No 1,094; scale,  $m = 1\cdot5$  inches, F. A. Cudlip, R.N., 1834.

northern end of the island in a northerly direction for nearly a quarter of a mile, leaving the passage one-third of a mile wide, with 5 and 6 fathoms water; the reef is dry at low water, and there are  $3\frac{1}{2}$  fathoms close to its edge; the winds in this passage are generally baffling, and unless when blowing directly through, it is not desirable for anything but coasters.

**Rock.**—Southward of the harbour there is a detached rock, uncovered 6 feet at low water, distant 4 cables from the nearest shore; from it Kiahou islet bears N. by W. one mile distant, and Whora island south extreme N.N.E.  $\frac{1}{4}$  E.  $1\frac{1}{3}$  miles.

**Tides.**—It is high water full and change at Maurhangì at 7h. Om., and the tides rise from 7 to 10 feet.

To the southward of Maurhangì harbour the coast trends S. by W. 5 miles into the bight which lies to the westward of Wangaproa peninsula; this coast, on which are some hot springs, has several rocky ledges and detached reefs lying off it, and should not be approached within half a mile, at which distance 6 fathoms will be found; these dangers can be seen in the day time.

**Caution.**—Vessels may anchor in this bight, in from 8 to 14 fathoms, with westerly or southerly winds, but its head should not be approached within one mile, as the water shoals to 4 fathoms, and flats extend a long distance off; with strong north-east winds, vessels should not get embayed here, as a heavy sea sets in.

**WANGAPROA PENINSULA** extends from the main land in a N.E. by E. direction for 5 miles, and is nearly separated in two places by deep bays running in on both sides. Its eastern face and Tiri Tiri island form the Wangaproa channel; this channel has already been described (see p. ).

Wanga point, the north-east extreme of this peninsula, has shelving tidal rocks extending off it to the north-east, one-third of a mile, which are steep-to; a sunken rock with 9 feet, and 6 fathoms close to it, lies from the shore westward of Wanga point, nine-tenths of a mile; it lies off the northern edge of an outlying reef, dry at low water springs, between which latter and the shore there is a narrow channel with  $3\frac{1}{2}$  fathoms. From this sunken rock, Wanga point bears S.E. by E.  $\frac{3}{4}$  E., one mile, and the high rock off the north end of Tiri Tiri island E.  $\frac{3}{4}$  N.,  $3\frac{1}{4}$  miles.

**Anchorage.**—On the southern side of Wangaproa peninsula is good anchorage, in 6 fathoms, with northerly winds, in a sandy bay about a mile from the south-east extreme;  $1\frac{1}{2}$  miles farther west is another bay, off whose western extreme is a rock out of water, lying a quarter of a mile from the shore.

**TOFINO BAY** is the western bight; here there is anchorage in 5 to 6 fathoms with northerly and westerly winds; at the head of the bay are two small rivers, the northern has 3 feet water on its bar at low water,

and 2 fathoms inside; it is navigable some miles for small coasters: the southern river is dry at low water. Three miles to the southward of these rivers is a reef of rocks extending three-quarters of a mile off the shore, dry at low water: from this reef to the north head of Auckland harbour there are no dangers, and the coast may be safely approached within half a mile.

### FRITH OF THAMES.

Cape Colville, the eastern limit of the Hauraki gulf, is the northern extremity of a peninsula more than 40 miles in length, the western shores of which form the eastern boundary of the Frith of Thames. Throughout the whole length of this peninsula runs a chain of high and wooded mountains (2,000 feet), rising abruptly from the sea on either shore.

**Soundings.**—The entrance of the Frith of Thames is 16 miles in breadth from cape Colville to Waiheki island, with uniform soundings of 22 to 26 fathoms mud, gradually decreasing to the bar of the river Thames.

**COROMANDEL HARBOUR\*** (*Waihou*) is 20 miles S.S.E. of cape Colville, and 14 miles E.N.E. from the eastern entrance of the Waiheki channel. Its position is well marked by a remarkable hill with a square rocky crest, Castle hill, which lies 3 miles eastward of the head of the harbour, and may be seen for many miles, attaining an elevation of about 1,600 feet; the entrance will also be easily known by the small round islet Tuhua lying  $1\frac{1}{2}$  miles immediately west of it; a smaller rock lies a quarter of a mile south of Tuhua: there are likewise three islands to the north-west of the north head, each from half a mile to one mile in extent, the extreme island being more than three miles distant. In entering, a vessel may pass on either side of Tuhua, in deep water.

Coromandel harbour is formed on the north side by the peninsula of Waihou, which is joined to the main by a narrow sandy neck and on the south side by the main land: the harbour runs north-east and south-west, is one mile wide at the entrance, and carries a depth exceeding 5 fathoms for  $1\frac{1}{2}$  miles inside.

**Anchorage.**—The best anchorage is immediately round the south-east point of the peninsula of Waihou, about 3 cables off shore in 4 fathoms: a quarter of a mile above this anchorage the water shoals to 14 feet, and the large expanse of water at the head of the harbour has a depth of a little more than one fathom: there is also a shoal patch of 4 feet, 3 cables above the anchorage; it bears from the south-east point of the Waihou peninsula N.E. three-quarters of a mile, and from the sandy neck S.E. by E. the same distance; vessels in taking up an anchorage should not open out

\* See Admiralty plan, Coromandel harbour, No. 2,035; scale,  $m = 2\cdot0$  inches, by Captain Stokes, H.M.S. *Acheron*, 1850.

this sandy neck ; they are then certain to be clear of the shoal patch, and in not less than 3 fathoms.

**COAST between CAPE COLVILLE and COROMANDEL HARBOUR.**

—The three islands which lie immediately north-west of Coromandel harbour are Huieh, Waimata, and Hoki. Huieh, the northernmost, is high and cliffy on its northern and western sides, terminating in a low shingle point to the eastward, and is half a mile in extent ; a small islet lies a quarter of a mile north-eastward of this low point, and another one to the south-west of its western point ; there is also a rock above water a quarter of a mile off its south side.

**Waimata**, the middle island, one mile in length north and south, is a double island connected at low water by a sandy neck ; the northern portion is called Ko-puki. N.W. by W. 3 cables from the north-west cliffy head of Waimata, is a reef of rocks covered at high water. The passage between Waimata and Huieh has a clear 3 cables' width with a depth of 10 and 11 fathoms.

**Hoki**, the southernmost and the smallest island, is half a mile long, having a passage of nearly the same width between it and Waimata, with 14 fathoms water ; a sunken rock lies half a cable off the southern end of the latter island. There is a passage for vessels between Hoki and the shore with 6 fathoms.

Two miles northward of this group is another chain of islands, extending along the coast to the north-west for four miles. Half a mile south of the southernmost island is a rock awash ; the passage between it and Huieh is  $1\frac{1}{2}$  miles wide, with 12 and 14 fathoms.

The northernmost of this chain of islands is a small islet lying S.W. by W.  $3\frac{1}{2}$  miles from the south point of Cabbage bay, which is a small bay midway between cape Colville and Coromandel harbour, having 3 fathoms water in it, and open to the westward : there are several rocks lying among these islands, and strangers should not pass between them, except in the wide channel, where the dangers have been more particularly described. There is, however, a channel between them and the main land, a mile wide in its narrowest part, and through which a vessel can run in perfect safety for Coromandel harbour, carrying from 7 to 10 fathoms water.

From Cabbage bay the coast trends north-westerly for 10 miles to cape Colville, and is bold and cliffy, the mountains rising over the cape in two distinct peaks to a height of 2,800 feet.

**TEKOMI HARBOUR.**—Two small harbours lie immediately south of Coromandel harbour : the first, Tekomi, is 3 cables wide at its entrance, and is well sheltered by the island of Rangipuka (three-quarters of a mile long in a north-west and south-east direction), lying close off its



entrance; half a mile inside the heads of this harbour a vessel may anchor in 4 fathoms:—there are 3 fathoms three quarters of a mile inside, but above that, shoal water. Rangipuka may be passed on either side: the north side is the best, as a reef extends to the southward from the south end of the island for nearly 2 cables.\*

**MENIA BAY**, a mile south of Tekomi, is not so good an anchorage; the two islands, Wekarua, extend half a mile to the westward off its northern head, and there is anchorage in  $3\frac{1}{2}$  fathoms, three-quarters of a mile inside their outer extreme: this bay is open to westerly winds.

Deadman point is the southern entrance point of Menia bay, and from thence to the mouth of the Thames river, nearly 20 miles distant, the coast line is straight.

**RIVER THAMES (Waiho).**—The approach to the low lands of the river Thames is known by a dense white pine forest on its west bank, a mile from the mouth; and the white mission house on the east bank, elevated 75 feet.

The bar, which extends  $3\frac{1}{2}$  miles from the river's mouth, and  $2\frac{1}{4}$  from the nearest east coast, has 5 feet at low-water and 15 feet at high-water springs. When the right extreme of the pine forest bears S.S.E.  $\frac{1}{2}$  E. and the mission house East, a vessel is on the bar, and Opani, the west entrance point, will bear S.E. by E.  $\frac{3}{4}$  E.; the channel from thence to the river is straight, one-third of a mile wide, with a depth of 2 fathoms at low water, which depth can be carried to Kopu, 2 miles above Opani, and close to which shore the channel runs; one-quarter of a mile within Opani point is a shoal of 4 feet, but having a depth of 12 feet in the channel.

**Anchorage.**—Vessels can anchor at Kopu in 12 to 15 feet at low water, where there is good landing. Vessels of 100 tons can reach Turua at half tide,  $5\frac{1}{2}$  miles from Opani; here again is anchorage in 2 to 3 fathoms, but the channel is narrow.

From Turua the river turns suddenly to the eastward, and winds again southerly  $7\frac{1}{2}$  miles and there is not less than 4 feet at low water: here is the junction with the Hikutaia; from Hikutaia to Opita, 10 miles, the channel has not more than 2 feet at low water, and the tide may be said to end here; one mile beyond Opita, the channel is 100 feet wide. The banks of the river Thames are of very soft mud.

**Tides.**—It is high water, full and change, at Opani point, at 7h. 35m.; rise of tide 10 feet, strength of tide 3 knots: at Turua 7h. 59m., and at Hikutia 8h. 34m., with a rise of tide of 8 feet.

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\* See Admiralty plan of Coromandel harbour by Captain Stokes, R.N., 1850. Commander Drury, in describing this harbour in the New Zealand Government Gazette of July 5, 1855, remarks "that the anchorage,  $2\frac{1}{2}$  fathoms, is within the island of Rangipuka, one-third of a mile from the entrance."

**DIRECTIONS.**—Vessels from Auckland bound for Kaueranga creek, should steer to pass 2 miles north of Oreri point, and from thence to Tararu point, a distance of 16 miles.

**LIGHTS.**—A *green* light, 18 feet above high water, is shown on the outer end of Grahamstown wharf, visible 2 miles, and between the bearings S.E.  $\frac{1}{2}$  E. round by East, to N.N.W.  $\frac{1}{2}$  W. As a guide for entering Kaueranga creek, a *red* light is shown, between the bearings, South round by East to N.W. The light is 28 feet above high water, and is visible 6 miles.

**Anchorage.**—Vessels may anchor in 7 or 8 feet at low water, when Tararu light bears N.N.W.  $\frac{1}{2}$  W. and Grahamstown wharf light bears S.E. by E.  $\frac{3}{4}$  E.; a depth of 10 or 11 feet, at low water, will be obtained when Tararu light bears N.E., Grahamstown wharf light bearing S.E. by E.  $\frac{3}{4}$  E.

**PIAKO RIVER**, running nearly parallel with the Thames, has its entrance nearly 5 miles to the westward of that river; it is much smaller, and only navigable for boats at low water.

Besides these rivers there are several creeks on the east side of the Frith of Thames navigable for boats at high water, and two creeks on the west shore.

**Pukorokoro river.**—The channel into the Pukorokoro river has a depth at high water of 7 to 9 feet, staked roughly on each side, and has a buoy at its outer extremity.

**WAIROA RIVER** (between the Thames river and Auckland) is 160 yards wide at the mouth; there is one foot at low water at the entrance, but within, the average depth is 6 to 4 feet, with a channel 125 yards wide. The first reach of half a mile has a depth of 6 feet, then 4 feet until 3 miles from the heads; above this it is shallow. A beacon marks the entrance.

**Tides.**—It is high water, full and change, at the entrance, at 7h. 15m.; rise of tide 8 feet.

## CHAPTER III.

THE GREAT BARRIER ISLAND—COAST FROM CAPE COLVILLE TO EAST CAPE, INCLUDING THE ISLANDS AND ROCKS IN THE BAY OF PLENTY.—EAST CAPE TO MAHIA, OR TERAKAKO PENINSULA.—MAHIA PENINSULA TO CAPE PALLISER.\*

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 VARIATION IN 1875.

East Cape - 14° 15' E. | Cape Turnagain - 15° 0' E.

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## GREAT BARRIER ISLAND.

THE Great Barrier island (*Otea*) is situated on the Eastern side of the Hauraki gulf, and affords great protection to it from seaward. It is 21 miles long in a N.N.W. and S.S.E. direction, and 10 miles across in its widest part, which is about the centre: a range of mountains of considerable elevation extends through its whole length, almost without interruption. Mount Hobson, the highest, is clothed with trees to its summit, and rises to a peak from the central part of the island to a height of 2,130 feet. There is good pasturage for cattle in the valleys and on the slopes of the hills; on the eastern side of the mountain range is a considerable extent of plain land.

The island is in parts thickly wooded; the kauri tree flourished at one time in great abundance on the high land; all within convenient reach, however, has been cut down and exported, or used for ship-building purposes. Small vessels are built and repaired at port Abercrombie, and in 1848 a vessel of 400 tons was built and equipped there, and carried away a cargo of copper ore from the mine which was then being worked at the northern end of the island.

The Moko Hinou and Fanal islands, with their outlying dangers, the Naivre and Simpson rocks, already described (see pages 16, 17) lie from 5 to 6 leagues north-westward of the north end of Great Barrier island. Little Barrier island (*Houtourou*) lies 8 miles westward of its central part.

The **Horn Rock** lies nearly mid-channel between the great and little Barrier islands, bearing from the south-east end of the latter, E.S.E. 4 miles; from False head of Great Barrier island S.W. 5 miles, and from

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\* See Admiralty charts of New Zealand coasts, sheets 2, 3, 4, Nos. 2,543, 2,527, 2,528; scale,  $m = 0.3$  inches.

the Pirogues rocks, W.  $\frac{1}{4}$  S. 7 miles, there are 12 or 13 fathoms close to it, and from 25 to 30 fathoms in the passages on either side ; it breaks when there is any swell.

**WEST COAST, GREAT BARRIER ISLAND.**—On the western side are several bays and harbours, for the most part open to westerly and south-west winds, but affording excellent shelter from easterly. They are, commencing from the northward, Catherine bay, ports Abercrombie and Fitzroy, Wangapara-para harbour, Okupu bay, and port Tofino.\*

The northern extreme of the island is a high peninsula, one mile in length, connected with the main by rocks, through which the sea washes ; several high pinnacle rocks stand off the extreme, from which circumstance it has been named Aiguilles, or Needles point.

From Needles point, the western coast trends S.W. by S.  $5\frac{1}{2}$  miles to Miners head, the north point of Catherine bay ; the summit over this head is a conical hill, resembling a beehive, and is a productive copper mine : there is a small cove immediately south of Miners head, where coasters anchor in fine weather and ship the ore : a rock awash at high water lies in the centre of it.

**Catherine Bay.**—The south head of this bay, Separation point, is nearly 3 miles S. by W. from Miners head, and has a remarkable pillar rock standing off it ; there are 25 fathoms water across the entrance, and it runs to the eastward for  $2\frac{1}{2}$  miles, narrows very rapidly, and terminates in two sandy coves, separated by a narrow peninsula projecting to the westward. On the north side of the bay, a quarter of a mile from the shore, and with a passage of 5 fathoms between, is a large flat rock (Bird rock), always awash ; it is nearly a mile to the north-west of the peninsula extreme at the head of the bay ; there are 12 fathoms between this rock and the south shore, and good anchorage half a mile to the south-east of it, with all winds from North round by East, to south-west, in 6 and 7 fathoms, sand and shells.

Coasters may get shelter from westerly winds in a cove on the south shore, three-quarters of a mile S.S.E. of the rock, in 5 fathoms sandy bottom, midway between the west point of the cove and the peninsula extreme ; but if the wind should come from the north-west a vessel should immediately work over to the north side of the bay, and anchor under the Bird rock, between it and the main in 5 fathoms. The coves at the head of the bay are shallow a short distance within the peninsula extreme.

**Port Abercrombie** is  $1\frac{1}{2}$  miles south of Catherine bay. Selwyn island, 2 miles in length east and west, lies in the entrance, and is separated on its south side from the main island by Governors passage, which is scarcely half a cable wide, with 10 fathoms water through it ; from sea-

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\* See Admiralty chart, No. 2,559 ; scale,  $m = 2\cdot0$  inches, ports in Great Barrier Island, by Captain Stokes, R.N., and officers of H.M.S. *Acheron*, 1850.

ward, Selwyn island would be taken for a part of the main. Immediately to the westward of Selwyn island are two smaller islets, about a cable apart; they are bold and steep, and the outer bluff of the westernmost is the remarkable headland, known as Wellington head, forming the southern entrance point of the port. N.E. by E. half a mile from this head is a reef of rocks, which must be passed to the northward; between the reef and the head is a small islet.

The entrance to port Abercrombie is  $1\frac{1}{4}$  miles broad, and there are 30 fathoms water across; it is entirely open to westerly winds, and the general depth of water is too great for convenient anchorage, ranging from 14 to 20 fathoms except in Nagle cove.

**Nagle Cove** is a small but secure anchorage immediately round the north head, where several coasters might lie in safety, and with room for two vessels of the size of sloops of war, when moored; Oyster islet lies in the centre of it. The depth of water in this cove is from 7 to 9 fathoms; here was the ship-building establishment; fresh water and fuel may be obtained without difficulty, and also numerous wild goats in the neighbourhood.

**Tides.**—It is high water, full and change, in Nagle cove at 6h. 25m. rise, springs 10 feet, neaps 7 feet.

**Port Fitzroy** is the inner harbour of port Abercrombie; it is an extensive sheet of water, well sheltered from all winds; its entrance, which is 2 cables in width, with a depth of more than 20 fathoms in it, bears E.S.E.  $1\frac{1}{2}$  miles from the north entrance point of port Abercrombie; as this entrance is bounded by high land on either side, flaws and violent squalls of wind will generally be met with in passing through; a quarter of a mile within, the harbour opens out to a general width of nearly half a mile, and extends for nearly 3 miles to the southward, with two bays branching off to the eastward about a mile in depth;  $1\frac{1}{2}$  miles within the entrance, the depth of water is from 17 to 14 fathoms, mud bottom:—when the narrow channel south of Selwyn island (Governors passage) opens out, the harbour expands to a width of nearly a mile, and with this passage again shut in, there is good anchorage, borrowing on the western shore, in 6 and 7 fathoms, mud bottom. There is a rock above water E.  $\frac{1}{2}$  S. half a mile from the south end of Selwyn island, with the Governors passage just open; this latter passage is only fit for boats, and has a rock under water (the Paget rock) in its outer entrance.\*

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\* Governors passage, though only 252 feet across at the narrowest part, is practicable and safe for steam vessels, as the sides are steep-to, like the entrance to a dock, and the narrows short in extent. The rock under water is not in the centre of the outer entrance, but is the Paget rock of the charts, where the danger in question is in its right position. It is, however, a dangerous patch, as it never uncovers, and there is no break to mark its position.—Captain Hope's Remark Book, H.M.S. *Brisk*, 1865.

**False or Bald Head** bears S. by E.  $\frac{1}{4}$  E.  $3\frac{1}{2}$  miles from Wellington head, and much resembles it in appearance and character; False head being also the westernmost of a group of islands which lie off the main island, leaving a passage between, a quarter of a mile wide in the narrowest part. Within the line of these two remarkable heads are several small scattered islands; a vessel may work freely among them, as there are no dangers but what may be seen:—30 fathoms will be found two miles off shore, and 10 fathoms within half a mile of this part of the coast.

**Pig Islands.**—Good anchorage for small vessels may be obtained in the passage between these islands and the main, in 4 fathoms, off the pebble beach on the centre island, nearly out of the tide, and sheltered from all winds but north-west, which latter would cause a swell to set in;  $3\frac{1}{2}$  fathoms is the least water in this channel at low water, but two rocks awash lie half a cable off the south-eastern point of the centre island. A chain of three steep rocky islets almost connected, and between which the sea is always breaking, lie parallel with and to the eastward of the southernmost Pig island; they extend off the point of the main island to the southward for half a mile, and a fourth of the same character, projecting to the westward lies at right angles to the southern one. There is deep water between the Pig islands and this chain, and the width at the southern entrance is three cables; a rock which breaks, lies a cable S.E. of the fourth islet, and another, which also breaks, a quarter of a mile to the eastward of the three.

To the eastward of the rocky islets the coast recedes, forming a bay, which meets within half a mile of the southern arm of port Fitzroy, but there is no shelter or anchorage in it.

The south side of the southernmost Pig island is a steep perpendicular cliff, with a conical islet, equally inaccessible, lying immediately off it; passing outside this island, 25 fathoms will be found close to, and Cliff island, a high steep wedge-shaped islet, with a sharp peak on its south end, will be seen bearing E.  $\frac{1}{4}$  S. 4 miles distant; Cliff island is more than a quarter of a mile from the shore with a smaller islet within; it may be passed close on its outer side in 21 fathoms.

**Wangapara-para Harbour** lies a little more than a mile to the eastward of Cliff island, running in a N.N.W. direction one mile, with a width of 3 cables. This is a snug little anchorage with all winds, except those between S.S.E. and south-west; in a cove immediately inside the western entrance point is  $4\frac{1}{2}$  fathoms, and this is the best anchorage.

**Pirogues**, three bare flat-topped rocks high above water, resembling boats under sail, and covering the space of a cable, lie off this part of the coast, and may be seen for several miles. They lie from the western head of the south Pig island S.E.  $\frac{1}{2}$  E. 3 miles, and from Cliff

islet S.W.  $2\frac{1}{2}$  miles; deep water will be found close to, and 22 fathoms between them and the shore.

**Okupu Bay**, one mile south-eastward of Wangapara-para harbour, is one mile wide at the entrance, and runs to the north-east one and a half miles; there are from 9 to 7 fathoms in it, and 3 fathoms, within a quarter of a mile of its head, which terminates in two sandy coves; a considerable stream emptying itself into the southern one. Okupu bay is entirely open to winds ranging from south to west, and therefore not recommended as an anchorage.

**PORT TOFINO** is the southern harbour, and bears S.S.E.  $2\frac{1}{2}$  miles from Okupu bay: the coast line between is straight and bold, with 15 fathoms a quarter of a mile distant; a small islet lies a quarter of a mile from the shore, half a mile before reaching the north head of the port; close off the north head is a high-peaked islet, and immediately over the head a remarkable conical peak.

The north and south heads lie W.N.W. and E.S.E. from each other 2 miles apart; when abreast the inner north head—a high cliffy peninsula—the entrance contracts to one and a half miles in width, the harbour running for the same distance in a N.E. by N. direction; three-quarters of a mile inside the peninsula, a flat rock, called Bird rock, lies a quarter of a mile off the north shore, nearly connected with it by a reef.

**Anchorage.**—Between Bird rock and the head of the harbour, there is good anchorage on the north shore in 6 and 7 fathoms, with all northerly and westerly winds; from easterly or south-east gales, a cove in the south-east corner of the bay affords excellent shelter in 4 and 5 fathoms, mud bottom; this cove is immediately to the westward of a high rocky peninsula point on the south side of the harbour, and small vessels might anchor far enough in to be sheltered from south-west winds.

**Soundings.**—Inside a line between the peninsula point on the south shore and the Flat rock on the north, the depths are from 9 to 10 fathoms, and outside it from 12 to 18 across the entrance.

**Caution.**—Port Tofino is a favourite anchorage with the coasters; the ebb tide, however, which runs to the south-east along this side of the Great Barrier island, sets strongly out of the harbour, and a vessel working in from the southward, unless with a fresh breeze, is liable to be drifted out,—the water being too deep to anchor,—and swept through the passage between capes Barrier and Colville.

**Rock.**—South of the southern head of port Tofino, half a mile distant, is a rock which does not always break, and between it and the shore another sunken one; 20 fathoms will be obtained a very short distance outside these rocks.

**Cape Barrier**, the south-east extreme of the island, is  $2\frac{1}{2}$  miles E. by S. from the south point of Tofino harbour, and midway between projects what

appears a peaked island, but is connected with the main by a low neck ; rocks extend a cable off cape Barrier ; and two, detached and breaking, lie 3 cables to the eastward of it : there are 28 fathoms, sand bottom, one mile off the cape ; within that distance the bottom is rocky. Vessels rounding this cape are recommended to give it a berth of two miles.

**EAST COAST, GREAT BARRIER ISLAND,** is destitute of harbours, and unless after westerly winds, there is generally a heavy swell setting on it. From cape Barrier, the coast trends north two miles ; a small high steep islet lies close off the shore one mile from the cape ; it then runs to the north-west 5 miles, where there is a sandy bight but no anchorage ; from this bight the land again trends to the northward, and at a further distance of 4 miles is the easternmost projection, a bluff rounding cape.

**Arid Island.**—North from this eastern cape, 2 miles distant, is Arid island, a bold clifty island, with landing on its western side in fine weather ; it is one and a half miles long in a north and south direction, and three-quarters of a mile broad ; off its eastern side, and extending to the east cape, are four small conical islets, all steep-to.

The coast from the east cape recedes to the westward, and at the distance of 4 miles is a sandy bay which extends in a north and south direction two miles :—this bay is immediately abreast Catherine bay, and the width of the island here is about  $2\frac{1}{2}$  miles, with an easy track across. There are 14 fathoms sandy bottom in the bay one mile from the beach, and 13 fathoms rocky bottom between Arid island and the east cape : a vessel might anchor in this bay with westerly winds if necessary ; off its northern point are two small islets, and the coast then trends N.W. by N. 5 miles to Aiguilles or Needles point.

**Soundings.**—At a distance of 3 miles eastward of the east cape there are 45 fathoms mud, and to the southward there is the same depth, fine dark sand. One mile outside Arid island there are 29 fathoms, sand bottom.

**Tides.**—It is high water, full and change, in port Abercrombie at 6h. 25m., rise from 7 to 10 feet. The flood tide, entering cape Colville passage, sweeps to the north-west along the western side of the Great Barrier island as far as False head ; it is there met by the flood stream which enters the Hauraki gulf from the northward, and causes during the springs confused riplings both off False and Wellington heads.

There is very little tide felt on the outside of Great Barrier island ; the flood tide runs to the northward.

#### COAST FROM CAPE COLVILLE TO MERCURY BAY.

**CAPE COLVILLE.**—A sandy bay nearly a mile in extent lies on the north coast of this cape ; the eastern point of this bay may be called the pitch of the cape, and a reef of rocks extends nearly three-quarters of a



mile to the northward of it. The tide races are strong off cape Colville, and vessels are recommended to give it a berth of one and a half miles, should they pass between it and Channel islet (*Takoupo*), which latter bears from the cape N.N.W.  $\frac{1}{4}$  W.  $2\frac{3}{4}$  miles; but unless with a commanding breeze, it is recommended to pass to the northward of Channel islet.

Cape Barrier, the south-east extreme of Great Barrier island, bears from cape Colville N.N.E.  $12\frac{1}{2}$  miles, and between these two capes is the eastern approach to the Hauraki gulf.

**CUVIER ISLAND**, which bears from cape Colville E.N.E. 20 miles, is 2 miles long in an east and west direction, and rises to a rather remarkable peak; it is visible from a considerable distance, and serves as a finger-post to the channel.

From cape Colville the land trends E. by N.  $\frac{1}{2}$  N. 3 miles to a similar rocky headland; W.N.W. from which, three-quarters of a mile distant, is a rocky islet similar in feature to the Channel islet. The coast then runs to the south-eastward, nearly 4 miles to Charles cove, a small bay running to the south-east, but exposed, and not desirable even for coasters, as from shoal water they cannot enter sufficiently far for shelter. Half a mile to the north-west of the eastern head of Charles cove is a small islet, and the coast continues its south-easterly trend 4 miles further to a clifty point, Three miles S.S.E. of this clifty point is Waikawau bay and river, both unimportant and unsheltered; three rocks above water lie half a mile off the coast, a mile south-eastward of the bay.

**KENNEDY BAY** (*Aratuhu*) is distant 4 miles from Waikawau; its entrance, which is half a mile wide, bears from the north-west end of great Mercury island S.W.  $\frac{1}{4}$  W. 9 miles; it affords fair anchorage for small vessels in 4 and 5 fathoms, with westerly winds round from north to south.

**Rock.**—N.E.  $\frac{1}{2}$  N. from the outer south-east clifty point of this bay, three-quarters of a mile, is a rock awash; there are 6 and 7 fathoms between it and the shore.

South-eastward of Kennedy bay are two sandy beaches, each about a mile in extent; round the clifty south head of the southern beach is Wangapoa river, fit for coasters, having 5 feet water on its bar at low water; there is a native village inside; the south point of this river is sandy, and a sandy beach extends for 2 miles to the eastward of it.

From Wangapoa river the coast trends E.N.E. 8 miles to Tepaki point, which latter is nearly 4 miles to the north-westward of the north entrance point of Mercury bay: off this point lie the Mercury islands.

**MERCURY ISLANDS** (or D'Haussez group).—This group consists of four principal with several smaller islands, as also low reefs and rocks interspersed among them; they occupy a space of 10 miles from north to south, and the same distance from east to west.

**GREAT MERCURY ISLAND** (*Ahou Ahou*) is the largest, being 4 miles long from north to south, and nearly 3 miles broad at its southern part; it is steep and cliffy on the northern and eastern sides, with its highest summit towards the south-east end. On the west side is a deep bay, with anchorage in 5 fathoms in its north-east part in fine weather; this bay renders the island very narrow in the centre.

**Danger.**—A sunken rock about 150 feet in diameter, with 4 feet water on it at low water spring tides, has been discovered in the fairway entering Mercury island harbour, the following bearings mark its position; extreme south-west point of island S. by E.  $\frac{1}{4}$  E., the inner of the two rocks at entrance of bay W.S.W. These rocks in one lead nearly over the danger.\*

**Rock.**—The south end of Great Mercury island is 6 miles to the northward of the north point of Mercury bay; its north end bears from Cuvier island S. by E.  $8\frac{1}{2}$  miles, and from the eastern part of cape Colville E. by S. 18 miles; a rock 20 feet high lies  $\frac{1}{2}$  a mile N.E. by N. from the north-east point of the island.

**RED MERCURY ISLAND.**—(*Wakahu*) 3 miles in circumference, is the outer or easternmost of the group; it bears from the south-east end of Great Mercury E. by N. 4 miles distant.

**Richards Rock**, a dangerous rock, which uncovers only at low springs, lies N. by W.  $\frac{3}{4}$  W. from the north cliffy point of Red Mercury island,  $1\frac{1}{2}$  miles distant; it also bears from the south-east end of Cuvier island S.E. by E. 11 miles, and from the north-east end of Great Mercury island E. by N. 7 miles; this outlying danger has deep water round it, and only breaks occasionally.

**Caution.**—Between the Great and Red Mercury islands are the islands Kawitihu and Kora-puki, with several smaller islets and some low reefs; south of Kora-puki, nearly a mile, are two rocks awash; the passages between these islands should be avoided.

**OHENA**, the southernmost island, lies E. by N.  $2\frac{1}{2}$  miles from the north entrance point of Mercury bay. Two low reefs bearing from N. by E. to N.E. extend from one to  $2\frac{1}{2}$  miles off its north extreme; and north-west of it are two small low islands 20 feet high, one and one and a half miles distant respectively.

**KORUENGA ISLETS.**—Half a mile from the north entrance point of Mercury bay are the steep gray islets, named Koruenga, 150 feet high, the outer islet being known as the Needle.

**Man Rock.**—At nearly a mile eastward, from a point one and a half miles north of the north entrance point of Mercury bay, is Man rock, a small round islet; midway between Man rock and the point is a sunken rock.

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\* Reported by Mr. W. Simpson, late master of the revenue cutter, *Ringleader*.

**MERCURY BAY.\***—This large inlet, 30 miles south-east of cape Colville is 5 miles wide at its entrance, and affords anchorage during westerly winds in sandy bays on its north and south shores, and is the seat of a considerable timber trade. Cook's bay, on the south side, at the mouth of the Oyster river, is the preferable anchorage. At the head of Mercury bay, in the south-west angle, is Mangrove river, a snug anchorage, and secure from all winds.

**Directions.**—Mercury bay may be approached from the northward, either by passing outside the Mercury islands, and entering between them and the Alderman islands, or by hugging the coast; the latter is often preferred for the sake of keeping the weather shore on board.

If the outer passage is taken, there are no dangers which are not visible, except Richards rock before described, which must be carefully avoided, lying as it does in the track from cape Colville; between the Mercury and Alderman groups there are 40 fathoms water, decreasing gradually to 20 fathoms across the entrance of Mercury bay.

The approach to Mercury bay by the inner passage is between Great Mercury island and Tepaki point, a channel 3 miles wide. Tepaki point has some small islets off it, and is the north-west point of a sandy bay; passing it within one mile, steer rather close outside the next point which bears S.E. by E. nearly 2 miles from it; one mile off this latter point is Man rock, and between the two midway, a sunken rock exists; the point must be therefore kept rather close on board; there are no dangers near the point, and there is a depth of 9 fathoms between it and the sunken rock.

There is also another rock nearly awash at low water, in a line between the point abreast Man rock and the steep gray islets of Koruenga, which lie off the north entrance point of the bay. It is preferable to shape a course outside this rock awash at low water, as well as the Koruenga islets, although there is a channel of 9 fathoms within; a rock, one cable off the north point of Mercury bay, covered only at high water, must also be avoided.

**Twins.**—Having passed Koruenga island, which with the islets off it are steep-to, the Twins, a double conical islet one and a half miles within, will be seen; this islet is also steep-to. Before reaching the Twins is Matapana bay, having 5 fathoms, sandy bottom; off the west point of this bay a ledge of rocks extends one-third of a mile towards the Twins; after this the north shore is clear to Buffalo bay.

The middle island in Mercury bay (*Motu Korure*) has foul ground off

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\* See Admiralty chart, Mercury bay, No. 2,574; scale,  $m = 2 \cdot 0$  inches, by Captain Drury, R.N., 1855.

its north-west and south-east extremes for 2 cables, but is bold to the westward.

**Tower Rock** (*Moturoa*) rises abruptly to a height of 188 feet, within one mile of the southern entrance point, and has also foul ground 2 cables round it.

**Sunk Rock**.—Approaching Mercury bay from the southward, in the southern entrance, this rock exists, seldom showing, but which occasionally breaks; there are from 9 to 13 fathoms round it; it bears N.N.W. three-quarters of a mile from Te-Tui or Mahurangi, the island forming the southern entrance point of the bay, and E. by N. one and a half miles from Tower rock.

The passages among these islands about the southern entrance should be avoided.

There are no other dangers in Mercury bay than those which have been mentioned, until Shakspeare cliff is passed; the soundings will be found to decrease gradually, there being 10 fathoms on either side of the Middle island, and  $3\frac{1}{2}$  to 4 fathoms up to the Shakspeare cliff, off which a vessel may anchor, with the cliff bearing from South to S.S.E., but should not proceed higher,—unless intending to enter Mangrove river,—to avoid the Pandora rock of 8 feet, and some detached banks of 9 and 12 feet, which extend nearly half a mile from the shore between Shakspeare cliff and the east entrance to Mangrove river.

**Mangrove River**.—To sail into Mangrove river, run midway for Buffalo beach, at the head of the bay; by keeping the Twins just open of Koraga islet, bearing N.E.  $\frac{3}{4}$  N., Fly bank is avoided (the north-western-most of the shoal banks just noticed), and hauling up for the river steer a middle course; but avoid a spit on the beach side by keeping a distant round red hill on with high Pah point; this spit extends off the beach just before reaching the low Pah at the entrance of the river; after passing this Pah, moor in mid-channel. Vessels undergoing repair haul alongside the builder's yard or run aground above high Pah point. The river above the high Pah, although extensive, is only navigable for boats.

**Water**.—Fresh water can be procured round the high Pah point, and there is a carpenter's yard near the anchorage, where ships have been repaired.

A steam saw mill is situated at the entrance, and another about 6 miles up the river. These mills employ from 60 to 70 Europeans, two-thirds of the number being at work in the bush felling trees.

During the two years 1871 and 1872 about 2,000 tons of Kauri gum were shipped from the bay, but the gum is now reported to be nearly worked out

Gum town, situated about 9 miles up Mangrove river, contains three or four stores belonging to the Kauri gum traders. When the supply of gum ceases this settlement will probably be abandoned. The township has a good pier available for vessels of light draught.

**Oyster Creek**, although of considerable breadth, is hardly navigable for canoes.

**Tides.**—It is high water at Mangrove river on full and change days 7h. 21m.; rise, from 5 to 7 feet. The tides must be considered in entering Mangrove river, and vessels should go in at last quarter flood: it would be better to be there about slack water, for there is no room to round-to, and the tides run from three to four knots. The least water in the channel going into the river at low-water springs is 14 feet, at high water 21 feet.

Mangrove river causes the tides in Mercury bay to be scarcely perceptible on the south shore; but on the north shore, at springs, they run one and a half knots; this can be taken due advantage of in working in or out.

**Pilot.**—If on the approach of an easterly gale it is required to run for Mangrove river, it should be taken as soon as possible, for the sea rolling into the bay would break across the shoaler parts of Buffalo bay; one of the builder's men at the entrance of the river might act as pilot if required.

The northern shores of Mercury bay are wooded; the treble peak rising above Mahunganape is 1,026 feet high; the south shore is barren and uncultivated; a long flat country extends from Buffalo bay to the high ranges over Coromandel harbour.

Captain Cook's observations on Mercury bay show the remarkable changes that have taken place during the last eighty years in the formation of the coast, as well as in the decrease of the native population. He describes and leaves a sketch of a rock connecting Mahunganape and the main, with the arch under it, and above, a Pah. It still exists, and in similar shape, but has dwindled to such a small sharp rock, that where the Pah stood, a man could now only sit as on a horse. Similar effects have taken place on Shakspeare cliff, which is fast supplying rocks to the depths below; indeed, the whole coast here is more than ordinarily perforated, and one cave on the north shore was penetrated to 500 feet. having there a depth of 4 fathoms.

#### BAY OF PLENTY.\*

The Bay of Plenty is the name given to the long extent of coast comprised between Mercury bay and cape Runaway, near the East cape: a line drawn between these two points measures 120 miles, and the greatest

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\* See Admiralty chart, No. 2,527; scale,  $m = 0.25$  inches, by Captain Drury and officers of H.M.S. *Pandora*.

depth of the bay from such a line is about 40 miles. There are a number of islands and detached rocks in this extensive bay; the only anchorage in it of importance, and which offers shelter for any vessel larger than a coaster, is Tauranga harbour; the coast trends from Mercury bay S.S.E.  $\frac{1}{2}$  E. towards this harbour, a distance of about 55 miles.

**Castle Island** (*Ngatutu*), a small steep islet lies E. by S.  $\frac{1}{2}$  S. 4 miles from the south point of Mercury bay; it is 50 feet high, white in colour, and steep-to; 39 fathoms will be found 3 cables distant.

**Aldermen Islands** are a group of small islands, with off-lying rocks; they lie E. by S.  $\frac{1}{2}$  S. 14 miles from Mercury bay, and are 9 miles from the nearest part of the main land.

These islands are here noticed as being contiguous to the coast, but will be more fully described hereafter, together with the various islands in the Bay of Plenty. See page 98.

**Tairua River**.—Ten miles southward of Mercury bay is Tairua river, a small place available only for coasters; the intermediate coast is broken into sandy bays and cliffy points, with from 20 to 14 fathoms water one mile off shore.

**Shoe Island**, when seen from the north-west, exactly represents its name, even to the tie; it lies E.N.E. from the north cliffy head of Tairua,  $1\frac{1}{2}$  miles distant, and is about one mile in circuit; half a mile eastward of it are some black rocks above water: it has a small coasters' harbour, with 6 feet at the entrance.

**Slipper Island**, so called from its shape, lies S.E. 4 miles from Tairua head, and 2 miles off shore; it is nearly 2 miles long north-east and south-west, and having a reef out of water, extending from its south end one and a half miles to the southward. Between Slipper island and the main land, bearing S.W. one and a quarter miles from the north end of the island, is a rock above water, 2 cables north of which is a sunken rock, which generally breaks heavily.

There is a temporary anchorage in fine weather under Slipper island, in 6 fathoms, off a sandy bay on its south-west side.

S.S.W.  $2\frac{1}{2}$  miles from Slipper island is the Warekawa stream, at the southern termination of a sandy beach,  $2\frac{1}{2}$  miles long.

**Whangamata River**.—Five miles southward of Warekawa stream is Whangamata river; its north entrance point is cliffy, the south is a sandy point, with a round cliffy islet (Clarke islet), projecting from it. South-east of this islet, at distances of half a mile and one mile, are two smaller islets, the Wedge and Sugar Loaf. The two entrance points of the river project so as to form a bay outside, where a vessel may anchor with off-shore winds in 4 fathoms, half a mile from the shore, with the entrance open. Whangamata river bears west from the Mayor island 17 miles dis-

tant, and from the south end of Slipper island, South 8 miles; the coast is free from danger, having 30 fathoms 6 miles off shore, decreasing to 9 fathoms within one mile of it. From Whangamuta river to Kati-Kati river is 15 miles, with no dangers on the coast between them.

**Kati-Kati River.**—The entrance, which has only one and a half feet on the bar, bears from Mayor island S.W. by S. 15 miles; on the north side of the river is a sandy bay 4 miles long, and the coast to the southward, between it and Tauranga harbour, is a straight sandy beach 13 miles in extent.

Te-ho, the north head of Kati-Kati, is 170 feet high; two miles east of it the water shoals suddenly from 6 to  $3\frac{1}{2}$  fathoms, and breakers extend one mile from the entrance, which appears to be choked with banks; there is, however, a narrow channel on either side of a middle ground at the entrance, with not less than one fathom at low water, and deep inside. \* The Kati-Kati river expands to a considerable width within, and is connected by one of its arms with Tauranga harbour, affording a channel for boats at high water, thus forming a long sandy island between Te-ho and mount Monganui; at low water this channel is nearly dry.

**Karewha.**—W. by S.  $\frac{1}{2}$  S.  $7\frac{1}{2}$  miles from Te-ho head is the small island Karewha, 350 feet high: it lies 3 miles off the sandy beach, with a channel between of from 10 to 13 fathoms, sand and shells.

**TAURANGA HARBOUR,**† which, as before stated, is the only harbour on the east coast between Mercury bay and port Nicholson that affords shelter in all winds for vessels of burthen, is 13 miles south-eastward of Kati-Kati river: its entrance lies south 19 miles from the south end of Mayor island, and W.  $\frac{1}{2}$  S. 11 miles from the south end of Motiti island.

**Signals.**—For the New Zealand general harbour signals, see page 13.

The difficulty of entering this harbour through the deepest channel is its somewhat tortuous course, and the liability to eddy winds on rounding mount Monganui, the channel in one place being only half a cable wide; but with those winds which would make the bay of Plenty a lee shore, Tauranga harbour is the most accessible, and when once inside there is anchorage for a fleet.

The entrance to the harbour lies nearly north and south; the eastern head is the remarkable flat-topped hill Monganui, rising abruptly from the sandy shore to a height of 860 feet; the western entrance is formed by low undulating sandhills, which extend 13 miles northward to Kati-Kati river;

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\* Captain Carey of the steam ship, *Keera*, reports that, in 1872, the bar, on which was a depth of 18 feet at high water neap tides, was  $1\frac{1}{2}$  miles seaward of Te-ho head; to enter, Te-ho head should be brought to bear W.S.W. then steer directly for it, keeping that course until within a quarter, to half a cable of the head, then follow the land about the same distance until inside, where there is plenty of room, with 7 or 8 fathoms water.

† See Admiralty chart, Tauranga harbour No. 2,521; scale,  $m=8\cdot0$ .

one mile north-westward of Monganui, a spit with 9 feet extends eastward from the western sandy shore for one mile ; this spit generally breaks.\*

**The Approach to Tauranga Harbour** is remarkably distinct. Vessels bound to it from the northward should bring the south end of Mayor island to bear north, steering a South course ; the high flat-topped hill of Monganui will first appear like an island ; on this course, Karewha, a small rugged island, bearing from the entrance of the harbour N.N.W.  $\frac{1}{2}$  W. 6 miles, will be passed on the outside about 3 miles, in 23 fathoms, when the islet Motu-otau, and a hummocky projection from the sand, both within one mile eastward of mount Monganui, will be seen ; these are the only interruptions to an uniform sandy beach extending south-eastward 16 miles to Maketu ; the soundings decrease gradually after passing Karewha island, from 15 to 6 fathoms within one mile of the heads.

**Directions.**—Vessels about to enter the harbour must bring the summit of Monganui to bear South, and not eastward of S. by E. and then steer for it, until within two cables of North rock, thereby avoiding the bank extending from the west shore ; the channel in is one-third of a mile wide, and deepens from  $3\frac{1}{2}$  to 7 fathoms ; as Monganui is steep-to, keep not more than one cable from it until abreast of the *black* buoy, which lies in  $2\frac{1}{4}$  fathoms water, two-thirds of a cable from the shore ; then steer to pass 15 or 20 yards outside the beacon on Stony point, the channel here, although the deepest, is not much more than half a cable wide ; after Stony point is passed Monganui is again steep-to, and a good anchorage is found in  $5\frac{1}{2}$  and 6 fathoms in the first sandy bight a cable from the shore. Should the *black* buoy be, from any cause, removed, the mark for hauling round towards the beacon is the island of Motu-Otau, seen over the sandy flat just clear of Monganui.

**Caution.**—It is the opinion of those well acquainted with Tauranga harbour that no attempt should be made to enter until slack water, or nearly the last of the flood tide, as owing to the sharp turn at Stony point and the strength of the tide, vessels are liable to be set on shore on either side, before there is time for the helm to take effect ; vessels of moderate length and good steam power that steer well may, perhaps, afford to disregard this caution.

**Buoys.**—An experienced pilot is employed to look after the buoys, but none of them can be depended upon.

After northerly and easterly gales, the bar breaks right across from outer middle bank to Monganui bluff for some hours.

Vessels of any size can proceed a mile above Monganui, carrying from 5 to 7 fathoms water : it is advisable to keep about a cable off high-water mark on the left-hand shore, and the line of bank on the

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\* H.M.S. *Challenger* went out safely under steam in January, 1869.



opposite side, which is steep-to, will almost always show distinctly. There will be seen a small rise of ground on the left-hand shore, Maketu mound immediately above which the channel divides, one arm running to the westward with irregular soundings, and the other continuing towards Te-Papa, the Mission station. There is anchorage off Maketu mound in 6 or 7 fathoms.

**Te-Papa.**—The channel to Te-Papa, from the anchorage off Maketu mound, has 7 feet water. H.M.S. *Rosario*, drawing 14 feet water, has frequently been up the harbour at spring tides, as far as Te-Papa.

There is another anchorage near the western entrance to Tauranga harbour, which, if buoyed, would be generally the most simple. It is reached by keeping on the course, S.  $\frac{3}{4}$  E., and passing along the western shore until Monganui is shut in by the west sandy entrance point Pani-pani. In making for this anchorage, there is the Inner middle bank to be avoided; this bank is a quarter of a mile long in a north and south direction, and has 2 feet water; within it, on the west shore, there is a channel for small craft only: the bank is two-thirds of the way across from Monganui to the west beach, and its northern or outer end bears S.W. from the summit of the mountain.

To clear Inner middle bank, continue the course in, S.  $\frac{3}{4}$  E. until the extreme sand point on the right hand, (Pani-pani,) bears S.W.  $\frac{1}{2}$  W., then haul up towards it (it is steep-to), and keeping Monganui just shut in by it, an anchorage will be found in 6 fathoms sand, half a mile beyond the point, and about a quarter of a mile off shore. From this anchorage vessels can leave without detention, whereas within Monganui bluff, the prevailing wind being westerly and the channel off Stony point very narrow, a ship may be detained.

**Mission.**—Above Te-papa there is only a boat channel amid extensive flats, and 3 miles above, it narrows again into a small but deep river, running to the southward, which is navigable for boats for 15 miles, and by it a journey can be accomplished to the Roto-rua lakes in less than two days.\* Te-papa is the Protestant Mission station; the site is well chosen on elevated ground, on the south side of the harbour, three miles from Monganui; two miles westward of it is Otumoiti village, where there is a Roman Catholic mission establishment.

A large tract of land of superior quality, in this district, is now (1874) being settled under the public works and emigration scheme, and promises to be the most successful settlement in the province.

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\* Bi-weekly coaches running through the lake country viâ Taupo, from Napier, meet here, and tourists for the lake country make this their rendezvous.—*New Zealand Almanac*, 1874.

Alterations and additions to the Sailing Directions for Tauranga harbour, are from the authority of Commander G. Palmer, H.M.S. *Rosario*, 1870.

The total native population of the Tauranga district was in 1854 estimated at 1,000.

**Water.**—Fresh water can be obtained just within Stony point in small quantities.

During the twenty-three days H.M.S. *Pandora* was at anchor in Tauranga harbour in the month of November it blew very fresh, and almost continually from the south-west but such strong winds were considered unusual.

**Tides.**—It is high water at full and change at Tauranga at 7h. 10m., rise of tide  $4\frac{1}{2}$  to 6 feet: the strength of the tide at springs is 3 knots; in the narrow channel at Stony point it may attain 4 knots.\*

From Tauranga harbour, the coast, which is a uniform sandy beach, runs E. by S. for 15 miles to Kaituna river. The land between is covered with fern, and low, with the exception of two hill ranges of 600 and 800 feet, which rise one mile inland and extend to the south-west;—a remarkable flat-topped range of hills about 1,000 feet high rises 10 or 12 miles inland of Tauranga, and extends in a north-westerly direction.

**Motiti Island** lies  $4\frac{1}{2}$  miles off this sandy coast; there are 12 fathoms water midway between it and the shore. See page 99.

**Kaituna River.**—Town point (*Okure*), which is the east head of Kaituna river, is a cliff 100 feet high; from it towards Motiti island the ground is very foul, but no rocks are known to exist more than one mile off, that would bring a ship up: the entrance of the river is very narrow, and there are only 3 feet on the bar at low water: within, it expands considerably, and is navigable for boats 8 miles up. This river carries the surplus water from the Roto-rua lakes to the sea.

Just within the entrance of Kaituna, on the south-east side of the river, is the large Pah of Maketu. W.S.W. of the river entrance, at distances of 3 and 5 miles, three remarkable clumps of trees will be seen rising out of the low land.

**Waihi and Matata Rivers.**—One mile south-eastward of Town point is Waihi river, which runs in many branches through an extensive flat.

E. by S.  $\frac{1}{2}$  S. 15 miles from the same point is the Matata river, with a straight sandy beach the whole way. There are three streams between the Waihi and Matata rivers, the principal of which is Wai-taha-nui 9 miles south-eastward of the former, fordable at low water; on its bank, half a mile inland, is the conspicuous native Pah of Otamarapa.

At Matata river, coasting vessels are built. From it a range of hills runs south for 12 miles, forming the western boundary of an extensive plain

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\* Captain Freemantle, H.M.S. *Eclipse*, says that, at half an hour before low water, the ebb tide runs between 4 and 5 knots at Stony point, and the ebb stream runs out more than an hour after low water.

which lies between that river and the Whakatane; this range of hills is only separated from the foot of mount Edgcombe by the narrow valley through which the Amaote Atua river flows; the river, after winding through the plain along the eastern side of the range, becomes a branch of the Matata.

The white cliffs coastwise north-westward of Matata rise to a height of 500 feet.

**MOUNT EDGCUMBE** (*Putanaki*) rises abruptly from the plain (of which it is the southern boundary) to the height of 2,575 feet; it is 14 miles south of Matata river, and on the summit is said to be a lake of green water, probably the old crater of a volcano.

Eastward of Matata river, 13 miles, is the Whakatane river, with an extensive swamp at the back of the sand hills which skirt the coast between them, and the plain of fern and flax before mentioned as extending to the foot of mount Edgcombe.

**Whale Island** (*Motu Hora*) and **RU-RIMA ROCKS**.—Off this part of the coast is the island Muto Hora and the Ru-rima rocks; the former is N.W. by N. 5 miles from Whakatane river, and the rocks lie west from Muto Hora 4 miles; there is a passage  $2\frac{1}{2}$  miles wide between them and the shore, with soundings varying from 9 to 17 fathoms. See page 100, 101.

**WHAKATANE RIVER**.—Kohi point, the north-east point of this river, is 637 feet high, and has been covered with several paha, the ridges and ditches of which have a curious appearance. The channel into this river is between large boulder rocks just covered at high water; these rocks are on either side of the bar, which at low water has only two feet on it, and 9 or 10 feet at high water springs.

Whakatane river is a favourite port for the coasting trade. Schooners reach as far as Pupuarue, the mission station, 3 miles up, from whence the river bends to the south-east, and flowing through the hill ranges at the back, takes the name of Orewera.

The Matata and Whakatane rivers are connected by the Orini, a branch of the former which flows towards the latter, and is navigable for boats; it runs parallel with the sandy beach about one and a half miles from it.

**Ohiwa River**.—Seven miles eastward of Kohi point is Ohiwa river; it is broad at the entrance, being half a mile across at high water, but appears surrounded by shoals; within, it branches into three arms running through extensive mud flats; the bar is one mile to seaward.

Half a mile eastward of Ohiwa river is a wooded cliff about 500 feet high, which, as it stands alone on the coast, is a good guide to this river.

**OPOTIKI RIVER.**—Six miles further eastward—the stream of Waitohi lying between—is Opotiki river; the entrance is not more than a cable across; both heads are sand, with no natural marks to lead in. The bar changes with freshes, and north-east gales also affect it, the depth varying, but the river is navigable for ordinary coasters for one mile inside. Opotiki divides into two branches, half a mile within the points both running to the southward, nearly parallel to each other, and about 2 miles apart; the Church mission is on the western branch, 3 miles from the mouth; this river is in the depth of the bay of Plenty; and 7 miles eastward of it, the long extent of almost straight sandy coast may be said to terminate at Opape point.\*

**Soundings of Coast.**—The general depth of water from Kaituna river to this part of the coast, at ten miles off shore, is 30 fathoms, mud bottom, and at 5 miles, from 18 to 21 fathoms, sand.

**Tides.**—It is high water on full and change days at Opotiki river at 7h. Om., rise 7 feet. The flood tide runs to the westward along the coast.

**Features of Coast.**—From Opape point the coast trends about N.N.E. 22 miles to Waikana point, and its features are strikingly changed, being now broken into numerous small sandy or shingle bays with rugged cliffy points between.

Three miles from Opape point is Pehetaire point, 800 feet high; east of which one mile, is a large double-fenced pah of Tunapapoa. The ground here shelves very gradually, having 18 fathoms, mud bottom, 5 miles from the beach.

Nearly 8 miles further eastward,—with three bays between,—is Koronohina point, 240 feet high, and round it is built the large village of Tokata. One mile south of Koronohina point is the small river Maraenui, expanding during freshes to half a mile in width, but in dry weather fordable half a mile from the mouth: its bar is 30 feet wide, and close to the shore; it is a tolerable boat harbour, having 8 feet water within.

**Omaio Village.**—From Koronohina point to Opokohino point and the village of Omaio is  $2\frac{1}{2}$  miles, with a rugged coast between. The peak over Opokohino point rises to 600 feet: the village is a large one, and is built on the bank of a stream of the same name, immediately eastward of the point.

Te Kaha point is 5 miles further to the north-east; there are two bays between, and extending off the middle point which separates them is the small peninsula of Motu-nui, where coasters haul into 5 fathoms and ride out north-east winds. The bay to the south-west of it is shingle, and

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\* The channel of Opotiki river is marked by moveable beacons. Captain Freemantle, H.M.S. *Eclipse*, 1866.

two small rivers empty themselves into it; the larger one is the Omaio just mentioned.

**Te Kaha point** has outlying rocks half a mile round it; from hence to Waikana point, an old whaling station, is four miles; midway between them and a half mile off shore is a reef of rocks just awash, to keep clear of which, steer outside the line of the points. There are high wooded ranges a short distance inland on this part of the coast; mount Hardy, S.E. by E. 9 miles from Te Kaha, rises to a height of 3,700 feet; also a coast hill immediately east of point Waikana, 860 feet high.

From Waikana point to Orete, the southern point of Wangaparawa roads, is N.E. 9 miles; for the first half of the distance, as far as Kotiki point, the coast is steep and rugged, with 35 fathoms mud bottom 2 miles off shore, decreasing to 20 fathoms at the same distance towards Orete point; for the remaining distance there are shingle beaches and rocky points, with three villages, and a small stream of Rau-ho-Kore.

Immediately west of Orete point there are sunken rocks three-quarters of a mile from the shore, and the ground is everywhere foul within half a mile of the coast.

**Tides.**—It is high water full and change at Te Kaha point at 6h. 30m., rise 9 feet.

**CAPE RUNAWAY**, the eastern termination of the bay of Plenty, is nearly 6 miles north-eastward of Orete point, and forms the north-east point of Wangaparawa roadstead; there are detached rocks lying a quarter of a mile to the northward of this cape, with 20 fathoms water near to, and 6 fathoms between them and the land. E.S.E. from these rocks is another rock awash at low water: it is recommended to give this cape a good berth as the tide runs strong in its vicinity, and there is generally a swell.

**Tides.**—It is high water full and change at cape Runaway at 9h. 16m., rise 7 feet.

**Wangaparawa Roadstead.**—With south-east winds there is anchorage in this roadstead off what was a whaling station at 2 miles S.S.W. of cape Runaway. Vessels of burthen should not approach the shore within a depth of 12 fathoms, anchoring about one mile west of the conical hill over the station, south of which one mile distant is Wangaparawa, a fordable stream, winding through a vast plain towards Hicks bay: up to this stream the coast is rocky, and it is difficult to effect a landing: beyond it there is a shingle beach one and a half miles long, and then about the same extent of white cliffs 80 feet high, having terraces of fine table land on their summits; a ledge of rocks extends nearly half a mile off the south end of these cliffs, and from thence a sandy bay to the long low point Orete.

**Caution.**—Upon the slightest appearance of a westerly wind, a vessel

should not remain at anchor off the whaling station ; and although well sheltered from a north-east wind, it would be dangerous to attempt to ride a breeze out from that direction, for these winds always shift to the northward and westward, and would bring in such a heavy sea as to render it very difficult to gain an offing.

The anchorage under Orete point, about half a mile within it, affords excellent shelter in south-west and westerly winds, by bringing the outer extreme of the rocks extending off it to bear W. by N., and anchoring in from 10 to 7 fathoms, fine sand; a great objection, however, to the anchorage in Wangaparawa roads is, that between the changes from south-east to westerly winds, there is frequently a calm, the westerly wind being preceded by a swell, and coming in flaws. H.M.S. *Pandora* was thus placed in a critical position on two occasions, during the survey.

**CAPE RUNAWAY to HICKS BAY\*.**—From cape Runaway, the north point of Hicks bay, *Motakawa* point bears east 17 miles; including the former cape, there are three points of land between, of the same formation, and therefore readily mistaken for each other, as in sloping seaward from the mountain ranges, they rise to a small peak before they again fall away in the same direction. Lottin and Midway points, the latter the eastern part of the same projection, and only one and a half miles distant, have this feature; there is a small sandy bight west of the former, and one east of the latter, but neither have anchorages.

**LOTTIN POINT** is 9 miles east of cape Runaway; in making the land from the northward, this part of the coast may be distinguished by a peak to the southward, which will be seen much higher than the general range, and by the land being lower to the westward of Lottin than towards Hicks bay. The hills bordering the coast are steep, and clothed with thick brushwood one-third of the way from their summits; their elevation varies from 1,000 to 1,500 feet high.

**Caution.**—The depth of water is considerable; should the wind fail there is no anchorage on this part of the coast, and with a constant swell setting towards it.

**Soundings.**—Soundings in 20 fathoms will be obtained two cables off shore, and 40 to 50 fathoms within one mile.

**HICKS BAY** is nearly 2 miles deep by one and a half miles wide, and is open to the eastward. The north point, *Motakawa*, is a long low rocky tongue of indurated sandstone, with a crust of scoria; the rocks off it are all visible, and there is 25 fathoms water within one cable of the entrance. The south point, *Ko-hau* or Iron point, is almost inaccessible; it forms the

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\* Cape Runaway may be easily known by its dark colour and oval shape, appearing almost like an island. Remark Book, Staff-Commander W. H. Sharp, H.M.S. *Liverpool*, 1870.

division between Hicks bay and the long bay of Panaruku to the south-eastward.

**Anchorage.**—Hicks bay affords secure anchorage in all westerly winds from north to south ; from north winds also, which are not uncommon, it is sheltered ; but vessels must get well within Motakawa point ; the bottom is greenish mud and good holding ground, shoaling suddenly towards the sandy beach at the head. The north and south shores are very steep, generally faced by perpendicular cliffs and outlying rocks ; the latter are within half a cable of high-water mark.

North-east gales, which generally spring up from the eastward and gradually freshen, give sufficient warning to weigh. No vessel should lie here with north-east or south-east winds :—from south-east winds, which are much more constant on this part of the coast than in the Hauraki gulf vessels may be sheltered by standing down towards the white cliffs, which are 5 miles south-eastward of Hicks bay, anchoring in from 9 to 12 fathoms in the Kawa-Kawa roadstead, one and a half miles westward of the Awatere river, and within one mile of the beach.

**Tides.**—It is high water full and change in Hicks bay, at 9h., rise 7 feet.

**Awatere river** is 3 miles E.S.E. from the south point of Hicks bay, at the eastern extreme of the sandy bay of Panaruku. Nearly a mile to the south-west of it is a table hill 900 feet high, and about the same distance to the south-east is a hill of 1,100 feet elevation.

**Water.**—Fresh water can be obtained in Hicks bay from a gully within half a mile of Mota-kawa point ; difficulty will be experienced in landing if the wind blows fresh outside, from a swell rolling into the bay ; there is also a considerable stream of fresh water 5 or 6 feet deep in the north-west corner.

**Supplies may be obtained** from a native village (Wharekahika) in the south-west nook of the bay. The natives catch the hapuka fish off Ko-hau point ; just within this point is a very small but deep cove, used by the natives as their best landing place, except the whaling station one mile from Motakawa point, where the isolated rocks form a boat harbour.

**From HICKS BAY to the EAST CAPE.**—From the north point of Hicks bay to the East cape islet, is E. by S.  $\frac{3}{4}$  S. 14 miles.

**Soundings.**—The soundings five miles off this part of the coast are from 40 to 50 fathoms sand, which decrease rather gradually to 14 and 10 fathoms within one mile. Across the entrance of Hicks bay and Kawa-kawa roadstead there are from 14 to 17 fathoms, and no dangers but what are visible.

The land about the East cape has a very mountainous appearance ; the summits of five distinct ranges may be seen backed by the snow-capped

Ikaurangi, a most conspicuous mountain, rising to the height of 5,535 feet, 28 miles south-west of the cape. The cape itself is of a remarkable white clayish sand, and this barren feature is continuous to Hicks bay, in steep cliffs to the westward, and in broken cliffs with valleys intervening to the southward.

**EAST CAPE ISLET.**—This islet, half a mile in circuit, is a type of the cape, with but a small proportion of stunted verdure; it is steep, almost inaccessible, and bounded by rocks, with a ledge extending from its northern extreme, N.N.E. half a mile.\* When the western points trending to Hicks bay are well open, the islet anchorage will be found in 16 fathoms, within two miles of it; and when the weather admits, a vessel might ride out the tide to great advantage.†

The water deepens again to the southward, until within one mile of the islet, when it will be found to shoal suddenly to 12 and 9 fathoms; the latter depth will be carried to within one cable of it. There is a channel nearly one mile wide between the cape and the islet, but as the winds here are liable to die away suddenly, leaving a vessel at the mercy of the tides and swell, it cannot be recommended.

There are several shoal patches off East cape, which, together with the strong tides, make the passage between the cape and the islet not a desirable one. A shoal patch with  $3\frac{1}{4}$  fathoms water on it, on which the sea would break in heavy weather, lies off the north-east point of the cape about two thirds of a mile; this is the line of breakers reported by H.M.S. *Eclipse* in 1864; there is another patch, nearly a mile S.E.  $\frac{3}{4}$  S. of the former, with  $2\frac{1}{2}$  fathoms water on it, at the entrance to the passage between East cape and the islet.

**Winds.**—The winds on either side of the East cape are frequently very different, although it may be blowing fresh. The strong westerly sea breezes which blow through the bay of Plenty are suddenly lost when passing south of East cape islet, the distinct line of breeze being curiously depicted on the water, and a vessel may be becalmed here for hours in sight of strong breezes.

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\* There is said to be sunken rocks  $2\frac{1}{2}$  miles E. by N. of the East cape, but I believe it arises from the race being very heavy.—From Commander Drury Remark Book, 1856.

† There is good anchorage on either side of the cape, which is very advantageous for vessels going either way, as the wind generally blows along the land, therefore they can always get a smooth anchorage. As it came to blow in strong squalls this evening from the S.E., anchored in 7 fathoms, about 5 (?  $2\frac{1}{2}$ ) miles westward of East Cape island, about one mile off shore; the soundings are pretty regular, on a sandy bottom.

Sounded the bay where we are lying and found it free from all danger, and the soundings gradually decreasing to two fathoms close to the beach: this bay is sheltered from all winds from south-east to West. The tides here are moderate, the flood running to the westward.—From the Remark Book of Captain Hayes, of H.M.S. *Driver*, 1846.



**Tides.**—It is high water full and change, at East cape, at 9h. Om., rise 7 feet. Northward of the East cape the flood tide sets to the westward. Southward of the East cape the flood sets in a northerly direction.

#### ISLANDS AND ROCKS IN BAY OF PLENTY.

The islands in the bay of Plenty commencing from the northward are, the Alderman group, Shoe and Slipper islands, Mayor island (*Tuhoua*), Karewha, Motiti, Plate island (*Motu Nou*), Whale island (*Motu Hora*), and White island (*Whakari*), with the Volkner islets.

The detached rocks are, Ru-rima near Whale island; the Astrolabe reef, and Schooner rocks, the former to the northward and the latter to the eastward of Motiti.

**ALDERMAN GROUP** is a cluster of basaltic islets scantily vegetated, with some outlying rocks resembling the stumps of trees; four of these islets extend in an E.N.E. and W.S.W. direction about 3 miles; one mile southward of this group is the largest islet, being little more than half a mile in circuit, and about 150 feet high.

Two rocks above water, and one awash, lie  $2\frac{1}{2}$  miles N.W. by N. from the eastern islet, as also two more one and a half miles W.N.W. from it; there is also a rock out of water, half a mile eastward of the southern islet. Including these off-lying dangers, the Alderman group occupy a space of more than 4 miles from north to south, and 3 miles from east to west, and may be seen from a distance of 10 to 15 miles. They are 9 miles from the nearest main land (north head of Tairoa river), with a depth of 25 fathoms in mid-channel between, but very steep to seaward, there being 100 fathoms less than 2 miles distant.

The eastern islet which when seen from a distance makes like a sharp pinnacle rock, bears from the outer or Red Mercury island S.E.  $\frac{3}{4}$  S. 21 miles, and from the south point of Mercury bay E. by S.  $\frac{1}{2}$  S. 14 miles.

**Shoe and Slipper Islands.**—South-west  $7\frac{1}{4}$  miles from the southern Alderman is Slipper island; it is  $2\frac{1}{2}$  miles from the main land, and has been already noticed in describing the coast: the Shoe, a small island lying one and a half miles east from Tairoa river, has also been described before, page 87.

**MAYOR ISLAND** (*Tuhoua*) is S.E.  $\frac{3}{4}$  S. 19 miles from the southern Alderman, and 14 miles from the main land. Between it and the latter are soundings in 50 fathoms, and 40 fathoms within one mile of the island.

This island is 7 miles in circumference, or  $2\frac{1}{4}$  miles long, north-west and south-east, and one and a half miles in breadth; the northern peak is 1,100 feet high: the centre is an extinct crater, open to the south-east, with stagnant water at the bottom; the western face of the island is covered with blocks of obsidian, giving it a remarkable dazzling appearance when

reflecting the sun's rays. On the south-east extreme is a pah, strongly defended by a deep cut or pass, partially artificial, through which invaders must approach, as the other sides have steep cliffs down to the water.

Immediately west of the pah is a bay, where anchorage may be had with sandy bottom; but as it is open to west and south-west winds, it would be seldom available beyond a few hours, during which a small quantity of provisions and water might be obtained: on the east side of the pah is a small cove, where coasters ride in northerly winds.

**Rock.**—One mile east of the pah point is a rock under water, which breaks with a moderate swell; it is half a mile from the nearest or south-east point of the island: close off the north point is a small sugar-loaf islet; the rest of the island appears perfectly clear of danger.

**Karewha Island** is small, rugged, and about half a mile in circumference; it is 6 miles N.W. by N. from Monganui hill, of Tauranga harbour, and is 3 miles from the mainland, with 14 fathoms water between, and within one mile of the island.

**MOTTI ISLAND** is flat, and triangular in shape: it is  $3\frac{1}{4}$  miles long north to south, and one and a half from west to east. Its greatest elevation, 190 feet, is at the northern end; the rest of the island is not more than 100 feet above the sea. This part bears from Mayor island S.E. by S. 19 miles and from mount Monganui E.N.E. 11 miles.

**Rocks.**—The distance between the south end of Motiti and the main land is 4 miles, with 12 fathoms, sand, in mid channel: there are two tidal rocks 4 feet high at low water, E. by S.  $1\frac{1}{4}$  miles from the south end, and another rock awash, between them and the point.

H.M.S. *Pandora* anchored off the north-west point of the island, half a mile from the shore, in 14 fathoms, rocky ground. The holding ground on all sides is very indifferent, and the east and south-east sides should not be approached within two miles.

A dangerous rocky patch, with about 5 feet water on it at low water spring tides, lies in the fairway of vessels passing between Motiti island and Astrolabe reef, bound to or from Tauranga. The patch extends about 70 yards, and from it mount Monganui bears S.W. by W.  $\frac{1}{4}$  W.  $9\frac{3}{4}$  miles, and north point of Motiti island E. by S.  $2\frac{1}{4}$  miles.

**Schooner rocks**, named from their likeness to a small craft at a distance, are 4 miles E.N.E. from the north-east end of Motiti island: these rocks are scarcely one cable in extent, of bold approach, and 62 feet high; there are soundings in 40 fathoms between them and Motiti.

A rock about three-quarters of a mile N. by E.  $\frac{1}{4}$  E. from Schooner rocks has been seen breaking.

**Astrolabe rock** lies north 4 miles from the north end of Motiti island: it is detached and uncovered at low water springs; the whole extent of

the danger is not more than two cables, extending E.N.E. and W.S.W., and would break almost always, but as it is covered at high water, in very fine westerly weather it might not show.\*

H.M.S. *Pandora's* boats found 20 fathoms all round the rock at 50 yards distance, and the ship passed 2 cables from it, sounding in 30 to 40 fathoms green mud and broken shells.

**Clearing marks.**—At the rock the flat summit of Monganui hill is exactly on a level with the ridge of the table land behind it; if a vessel is inside the rock, Monganui hill will appear above the distant land, and if outside it will appear below.\*

The bearings from Astrolabe rock are as follows :—

Monganui hill	-	-	-	S.W. $\frac{1}{2}$ W.
Centre of Mayor island	-	-	-	N.W.
Right extreme of Motiti island	-	-	-	S. $\frac{1}{4}$ W.

**Caution.**—This neighbourhood should be avoided at night, as Motiti island is low, and there is no other land near enough to guide the mariner.

**Plate Island** (*Motu Nou*), so named from its hollowness in the centre, lies E. by N. 7 miles from the south end of Motiti, and S.E.  $\frac{1}{2}$  S.  $3\frac{1}{2}$  miles from the Schooner rocks; between them are from 20 to 40 fathoms water.

The island is less than half a mile in extent; the highest part is 166 feet above the sea; deep water will be found all round it, except off the south end, where there is a ledge just above water.

**Whale Island** (*Motu Hora*) lies nearly 30 miles E. by S.  $\frac{1}{2}$  S. from Motiti island; it is 5 miles N.W. by N. from Kohi point (Whakatani river), and 4 miles from the sandy shore of the main land, with a depth of 13 fathoms inside it. The island is 1,167 feet high, one and a half miles in length from east to west, and half a mile from north to south; it appears bell-shaped from seaward, but on approaching there is a second peak on the west end.

H.M.S. *Pandora* anchored under a shingle spit off its south-west end, and there is no reason to doubt that with good ground tackle a vessel might ride out any gale here. The island being small, the back swell would be considerable, but at all events it is the only spot affording any shelter in this portion of the Bay of Plenty, in case a vessel should be caught in a north-east wind, and not able to hold her own. At the anchorage there are 6 fathoms, but small vessels may get close in under the shingle beach: † abreast of the anchorage is a boiling spring. Goats are

\* "This rock," remarks Commander Drury, "is in such a very different position from that assigned to the Astrolabe reef, that were we not convinced that no rocks exist in the position of the Astrolabe, I should have hesitated to give it this name."

† There is said to be a sunken rock  $2\frac{1}{4}$  miles N.E. of Motu Hora; we searched for it in vain.—From Commander Drury's Remark Book, 1856.

numerous, and there is some cultivated ground, but no residents. Fresh water is scarce.

**Tu-Rima rocks** are a dangerous cluster, lying to the westward of Whale island, some high above water, and others awash. Their easternmost portions are one mile in extent, east and west, and half a mile north and south, the highest rock being 120 feet above the sea, and about 300 yards in circumference: this rock lies west from the north end of Whale island distant 4 miles.

Detached patches extend to the northward, westward, and to the south-westward or towards the main land; taken together, they cover a space of nearly 4 miles from east to west, and 3 miles from north to south: the inner rocks extend to within 3 miles of the beach, the outer being 6 miles from it; both are awash, and there are 18 fathoms half a mile north of the outer ones. Vessels passing inside should keep the shore on board, which shelves gradually; there are 11 fathoms in the deepest part of the channel: these rocks, like Whale island, retain volcanic heat.

\***WHITE ISLAND** (*Whakari*), an active volcano, in latitude  $37^{\circ} 30' N.$ , and longitude  $177^{\circ} 12' E.$ , lies off the depth of the Bay of Plenty, 28 miles from the shore. It is about 3 miles in circumference, and 860 feet high; the base of the crater is one and a half miles in circuit, and level with the sea; in the centre is a boiling spring about 100 yards in circumference, sending volumes of steam 2,000 feet high in calm weather; round the edges of the crater are numerous small geysers, sounding like so many high-pressure engines, and emitting steam with such velocity, that a stone thrown into the vortex would immediately be shot into the air.

Here and there are lakes of sulphureous water dormant; but the whole island is heated so as to make it difficult to walk; from the edges of the crater, the scene below is only to be compared to a well-dressed meadow of gorgeous green, with meandering streams feeding the boiling cauldron; but on approaching, it is found to be the purest crystallized sulphur. No animal or insect breathes on the island, scarcely a limpet on the stones, and 200 fathoms will hardly reach the bottom within half a mile of its shores.

This island is the eastern limit of that extensive belt of subterranean

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\* The following is the description of a visit to White island, from the Remark Book of Mr. A. Thomas, Master, H.M.S. *Falcon*, Nov. 1st, 1866. In the afternoon hove to, and landed on White island. At the landing-place, which is on the south-east side of the island, there had been a slight landslip, probably resulting from the shock of an earthquake, reported to have been felt in the district of mount Edgecumbe a short time previous to our visit. The boiling springs instead of being in the centre of the crater as formerly have shifted to the north and inner end, while in the crater there is now a lake comprising a mixture of sulphureous and salt water; myriads of sea birds principally gannet, were seen on the north-west side of the island, also a few dwarfed bushes.

agitation which extends from mount Egmont through Tongariro, the Taupo and Roto Mahana lakes, to Whale island and the adjacent rocks Ru-rima, north of which line earthquakes are rarely felt.

**VOLKNER ISLETS** are three rocky islets, from 80 to 150 feet above the sea, lying 3 miles N.W. by W. from White island. H.M.S. *Pandora* passed between them and the island, without striking soundings, with 60 fathoms of line. Off the south-east extreme of White island is another rugged islet of about 30 feet high, half a mile from the shore; there is not the slightest appearance of any off-lying danger, and scarcely any tide is felt.

#### FROM EAST CAPE TO MAHIA, OR TERA-KAKO PENINSULA.

From the East cape to Open bay (*Waipiro*), a distance of 20 miles, the land trends S. by W.; the coast is varied by white streaked cliffs, with sandy beaches intervening, the country being more or less cultivated; the soundings 4 miles off the land are from 25 to 30 fathoms mud, and there are several rocks scattered along the shore within a mile.

Three miles south of East cape is the Wakori bluff, a cliffy projection, the land over it being from 500 to 600 feet high.

**WAI-APU RIVER.**—Six miles from East cape is the Wai-apu river, flowing through a sandy beach; it is a considerable stream at high water, but the freshes come down with great violence, so as to render it unsafe as an anchorage even for the smallest vessels; it takes its rise under Ikaurangi mountain, traversing the various ranges and draining a considerable extent of country.

**Rock.**—Between Wai-apu river and Wharariki point, about one mile from the shore, is a rock on which H.M.S. *Eclipse* struck, it bears N.N.E.  $\frac{1}{2}$  E., 2 or 3 miles distant from Wharariki.

**WHARARIKI POINT.**—The next point nearly 4 miles south of Wai-apu river is Wharariki, the south point of the Awanui stream, the land over it being 950 feet high; there are rocks extending for half a mile round this point, and  $3\frac{1}{2}$  miles south of it is the Repourua village, at the south end of a sandy bay. Cliffs extend for 2 miles to the southward of Repourua village, and south-east one mile from the northern end of these cliffs; one mile also from the beach are sunken rocks, with foul ground for half a mile outside them; between these rocks and the shore are 8 fathoms water, and there are only 10 fathoms 2 miles from the beach.

**Landing Place.**—There is landing on the north side of Wharariki point behind the reefs extending from it; but as there are several sunken rocks in the passage which only break in heavy swell, it cannot be recommended to strangers. The Maories make use of this landing in their whale boats when Wai-apu bar is unapproachable. A white house and some farm buildings mark the spot.

**KAIMOUEHU**, a round head 670 feet high, 3 miles northward of Open bay, is the next headland. Sunken rocks extend off it for one mile to the eastward, and the same distance in a north and south direction; there are 4 fathoms close to them, and 17 fathoms 2 cables to the eastward.

**OPEN BAY** (*Waipiro*) will be known by Tawhiti hill, which rises 2 miles south of the southern head, and is 1,670 feet above the sea: the width of its entrance is 4 miles from north to south, and little more than one mile in depth; there is a considerable stream (*Waikawa*) in the south-western corner of the bay, but the landing there is generally difficult.

In the middle of the bay, immediately north of the Pah, is a reef, a quarter of a mile from the beach, and close off the southern head is a small islet and some rocks.

Off the north point (*Matahau*) is another reef which extends northerly for nearly one mile parallel with the beach, and a quarter of a mile off shore; within this reef boats can effect a landing, and from whence produce is shipped; there are 9 fathoms in the middle of the bay in a line between the heads, and a rocky patch with 2 fathoms is said to exist in the north-west corner; another rock is said to exist one mile N.E. of Matahau point called by the natives Tokamonga. This bay can only be considered as a temporary anchorage, with off-shore winds.

From Open bay the coast trends S. by E. for 20 miles to Tolago bay (*U-awa*), the bays of Tokomarua and Waipari lying between. Some reefs lie off this part of the coast distant more than one mile, which will be noticed hereafter.

**Soundings.**—The soundings are regular, in 30 fathoms mud, 5 miles off the coast, decreasing to 20 fathoms sand within 2 miles of it.

**TOKOMARUA BAY** is distant  $3\frac{1}{2}$  miles from the south head of Open bay: the coast between is composed of precipitous cliffs, backed by the hill before noticed, Tawhiti, 1,670 feet above the sea, and the highest on the coast. East of this hill, and half a mile from the cliffs, is the islet Mowhioaru, about 30 feet high, and encircled by rocks.

Koatunui is the north cliffy head of Tokomarua bay, and Mawai,—a sharp barren projection 400 feet high, with rocks extending a quarter of a mile off it,—is the south point; they are 4 miles apart, and the bay is 2 miles in depth; two small rocks close together (*Hikutu*) awash at low water only, lie in the centre of it, one and a quarter miles from the sandy beach and N.W. by N.  $2\frac{3}{4}$  miles from Mawai, the south point; there is also a reef on the south side of the bay half a mile in extent, and one third of a mile off shore, which is visible.

**Soundings.**—There are 16 fathoms water across the entrance, and 6 fathoms inside the Hikutu rocks, which latter have 14 fathoms all round them; but no vessels, except such coasters as know the channels among the rocks, should attempt this bay; it is moreover a very open anchorage.

**St. Patrick's Cove.**—On the south side of Mawai point there was a whaling station in St. Patrick's cove, a small nook which is well sheltered for boats; it takes its name from a curious pinnacle, which, seen from seaward, appears like the gigantic figure of a man with his arms folded.

**Waipari Bay.**— $3\frac{1}{4}$  miles from Mawai point is Morahai head, the north point of Waipari bay, which is one and a half miles wide, and the same distance in depth, with sandy shores. The north point, and indeed the whole of this bay, is rocky; three quarters of a mile north-eastward of the north head is the small rocky islet of Motu-Ripa; there is a narrow channel of 5 fathoms between it and the shore. The island of Anaura forms the south head of the bay; it lies a quarter of a mile from the shore with a boat channel between, and extends three-quarters of a mile in an easterly direction; it is sterile and precipitous.

**Marau Bluff** is the next projection southward of Waipari bay; it is nearly 7 miles southward of Mawai point, and  $4\frac{1}{2}$  miles northward of Tolago bay; a reef of rocks awash (Tokamapuhia) lies rather more than a mile eastward of this bluff, and extends in a N.N.W. and S.S.E. direction for more than half a mile.

**TOLAGO BAY** (*U-awa*) is one and one third miles across, N.N.W. and S.S.E., from head to head, and about the same distance in depth; in it there is anchorage in all westerly winds ranging from north to south. The north head rises to 400 feet, and the south to 890 feet, both composed of the white marl so conspicuous along this coast.

**Spring Island**, three-quarters of a mile long in a north and south direction, lies immediately off the south head of Tolago bay, with a fordable depth between. The island is surrounded by rocks; off the north and south ends they extend a third of a mile.

The north head of the bay has an island off it (Motu Heka) which is also surrounded by rocks, and again north-east of the latter is a reef (Tatara) always breaking, its outer limit being one and a half miles from the north head. There is a passage of more than a quarter of a mile between the reef and Motu Heka, with a depth of 11 fathoms.

Tolago bay is clear of dangers; there are 10 fathoms sand between the heads, shoaling everywhere gradually, and 5 fathoms within half a mile of the sandy beach: there is one part, however, where an anchor will not hold well, the ground being shingle and rock; this small patch is one third the distance across from the south towards the north head, and it is better to anchor within this line. On the setting in of easterly winds, vessels should leave in good time, for the outer reef renders the beating out somewhat tedious.

**Cook's Watering Cove.**—Within the south head of Tolago bay is the cove where Cook watered, and beyond is to be seen the remarkable arch in the cliffs which he has described; several initials are cut on the rock,

where the artificial well exists made by his crew; there is some difficulty in getting water during the dry season.

H.M.S. *Pandora* obtained provisions here better, and at a more reasonable rate, from Europeans and natives than anywhere else on this coast.

**U-awa River.**—At the head of Tolago bay is U-awa river, with a bar of 5 feet, which is said to be constantly shifting; coasters have occasionally entered it; the principal branch has its rise to the northward.

The river is navigable, when inside the bar, and has been ascended for 16 miles by a steam vessel of 6 feet draught.

The population in 1873 consisted of 35 Europeans and 200 natives.

**Motara Bluff and Islet.**—Motara bluff, a cliffy point with an islet and some rocks extending a third of a mile from it, is  $2\frac{1}{2}$  miles S.S.E. of the south head of Tolago bay, and from it the Gable-end Foreland (*Pari-nui-te-ra*) bears S.  $\frac{1}{2}$  W. 7 miles, the coast between having rocks extending at low water half a mile off shore.

**CAPE GABLE, or GABLE-END FORELAND**, so called by Cook from its having a glaring triangular face, appearing like the white-washed gable end of a house; this appearance is contracted when within 3 miles of the land, but seen from the eastward it is very prominent; there are two patches of detached rocks one and a half miles north of the cape, about three-quarters of a mile from the beach; and a small islet one-third of a mile south-east of it, with a reef extending half a mile in the same direction. A reef of rocks also extends south of the cape a distance of 2 miles.

**Rock.**—The steam vessel, *Star of the South*, in March 1865, is reported to have struck on a rock about  $3\frac{1}{2}$  miles S.S.E. of Gable-end Foreland; from the rock Whangara islet bears W.S.W. about 3 miles.

From Gable End Foreland the coast trends S.W. by S. for 15 miles, to Tua-hini point, the north head of Poverty bay (*Turanga*); the shore between is rugged, with sterile hills rising to a height of 600 feet. Rocks extend a mile from the projecting points, having sandy bays within them, faced also by rocks.

**POVERTY BAY** (*Turanga*) is 5 miles in breadth from head to head, which lie north-east and south-west of each other, and are the southernmost white coloured projections on the coast, until Table cape (24 miles further to the southward) is reached; the bay is 4 miles in depth.\*

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\* The master of the ship *Excelsior* in 1873 states that the anchorage at Poverty bay is good, the ground being stiff clay, there is no fear of dragging, and from strong south-east winds, which are rare in summer, a ship loading in the bay could find shelter under Young Nick's head.



**Caution.**—The South, or Young Nick's Head, is 520 feet high, and has anchorage one and a half miles within it off the Wero-Wero river, in  $3\frac{1}{2}$  fathoms, half a mile from the mouth, but it is advisable not to approach the shore nearer than half a mile in entering, as the ground is very foul, changing from 8 fathoms to 9 feet; the bottom, however, is not rock, but apparently composed of vast fragments of the pipe clay cliff, which has from time to time slipped away—a common occurrence on this part of the coast, so liable to smart shocks of earthquake, and upon which the sea is rapidly encroaching.

**The North Head** (*Tua-hini*) has also foul rocky ground, extending to the south-east for 2 miles; at this distance H.M.S. *Pandora* shoaled suddenly from 16 to 8 fathoms; the summit of *Tua-hini* point is 260 feet above the sea.

**Anchorage.**—On the north side of Poverty bay, one mile inside the outer point, is *Tua-Motu*, which appears an island, but is joined to the main at low water; off this peninsula a reef extends 2 cables to the southward, and between it and *Turanga-nui* river are rocks half a mile from the shore, the outer ones of which are covered or awash at low water; with these exceptions, the bay is free from dangers, and a vessel may anchor according to circumstances; the bottom is sand, and the soundings decrease gradually from 12 fathoms across the entrance to 5 fathoms, half a mile from the beach.

It is recommended to weigh on any appearance of a breeze from the south-east, for from this quarter it freshens suddenly, and several vessels have been lost by waiting too long.

**RIVERS IN POVERTY BAY.**—There are three small rivers in the bay, *Turanga-nui*, *Koputetea*, and *Wero-Wero*; the first named is celebrated as the place where Cook first landed in New Zealand; from the untoward circumstances attending his landing, and unsuccessful attempts to obtain provisions, he named the bay Poverty.

**Turanga-nui river** is 2 miles westward of *Tua-Motu* peninsula, and is the northern termination of a sandy beach extending 8 miles from the south head; the soundings at the mouth of the river have during late years diminished. At the present time (1873), at low water spring tides, there are scarcely 2 feet at the entrance, but being greatly protected from the easterly swell, which always rolls into the bay, light boats with care in fine weather can cross the bar at all times of tide. Stakes have been placed to mark the passage over the bar, which is close to the westward of the stakes. At high water vessels drawing 8 feet can if the sea be smooth, cross the bar. Half a mile above the bar, the river branches off to the north-west and N.N.E. The depths vary at low water from 3 to 6 feet up to Reed's store, where the coasters lie.

**Water** in abundance can be had within the banks of the river ; in two places barrels have been sunk just above high water mark, from which a plentiful supply of good water can be obtained.

**Gisborne.**—The rising town of Gisborne is situated on the right bank of the Turanga-nui river, near the entrance, and in 1873 contained a population of about 600. The land in this district is considered superior to that of Hawke bay. The stock of sheep and cattle is large and increasing. Steamers running between Hawke bay and Auckland call here for passengers and produce.

**Anchorage.**—For communicating with Gisborne the best anchorage is in  $7\frac{1}{2}$  fathoms water, about three quarters of a mile to the south-west of a buoy which is moored in  $2\frac{1}{2}$  fathoms off the entrance of the Turanga-nui river.

**Buoy.**—This buoy is in the vicinity of a rock lately found by the New Zealand Government vessel *Luna*.

**Koputetea river** has about the same water on the bar as Turanga-nui, but is less easy to define ; its entrance is S.W.  $2\frac{3}{4}$  miles from Young Nick's head ; and may be known by a Maori village and a flagstaff on its north bank ; it is a much larger river than Turanga-nui, and a fine sheet of water when the tide is in ; and flows through one of the richest valleys in New Zealand, where about 30,000 acres of level land and excellent soil are partially cultivated, affording pasturage to a great extent, being clothed with natural grass.

The Koputetea is much more exposed to the surf than the Turanga-nui, and even during still weather it does not appear safe for a boat, except at high water or half tide. At low water the surf breaks across the bar.

**Mission.**—The Church Mission station, on the west bank three miles from the river's mouth, is now only represented by a school room, the church, which is full of fine Maori carvings, is rapidly falling into decay.

**Wero-Wero River** is now completely blocked up by the sand and shingle thrown up during heavy weather ; part of the river filters through this bank, and the remainder escapes by the mouth of the Koputetea river.\*

**Tides.**—At Wero-Wero river the time of high water at full and change is 6h 5m, rise of tide 6 feet. The flood tide outside sets to the northward, the ebb to the southward, and their influence extends 10 miles from the shore ; within Poverty bay the tide is scarcely perceptible.

**Soundings.**—From Young Nick's head, Poverty bay, to the neck of the Mahia peninsula, a distance of 19 miles, the coast is bold, and may be

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\* Alterations and additions concerning Poverty bay are from the Reports of Captain J. Moresby, R.N., 1878.

approached as near as convenient ; 24 fathoms will be found at 2 miles distant from the shore, and 10 fathoms at one mile ; but there is no landing until reaching Mahanga, which is within half a mile of the neck.

**ARIEL ROCKS**, a very dangerous outlying reef, which breaks only in heavy seas, bears E.  $\frac{1}{2}$  N., and is 10 miles distant from Tua-hini point, the north head of Poverty bay ; at low water spring tides it has on the shoalest part a depth of 12 feet ; this dangerous portion is less than half a mile in extent in a north and south direction.

**Soundings.**—The Ariel rocks are steep-to, shoaling at one cast from 23 to 6 fathoms within half a cable of the shoalest part ; there are 31 fathoms, green mud, between it and the shore, and 20 fathoms one mile to the northward ; in this direction it shoals more gradually than from the other sides. The vicinity of this reef may be known by the bottom being composed of coarse gravel and stones within a radius of two miles ; if the soundings exceed 35 fathoms a vessel is to the eastward of the reef.

**Bearings.**—The following are the bearings from the rock :—Cape Gable end Foreland (a conspicuous white cliff), N. by W.  $\frac{1}{4}$  W. 12 miles. Tua-hini (north head of Poverty bay), W.  $\frac{1}{4}$  S. 10 miles. False Gable (the nearest point of land), W. by N.  $\frac{1}{2}$  N.  $8\frac{1}{2}$  miles.

**Clearing Marks.**—The distance from the shore will render clearing marks available only in clear weather. Tua Motu peninsula, in Poverty bay, is shut in when to the northward of the reef ; when Tua Motu just opens like an island a vessel will be half a mile north of it ; also the top of the white Gable is nearly on a level with the land behind it, when at the reef.

During three days that H.M.S. *Pandora* was surveying in the vicinity of these rocks, they could not be distinguished until close to their position, and though the wind during the greater part of that time blew fresh from the N.E., yet there was no break ; but after a S.E. gale they were seen to break heavily from the shore.

**MAHIA or TERRA-KAKO-PENINSULA**, which is 12 miles long in a north and south direction, and nearly 9 miles north-east and south-west in its widest part, forms the northern head of Hawke bay, and is 20 miles south of Young Nick's head. The peninsula is connected with the main by a sandy neck about 2 miles in length and  $\frac{3}{4}$  of a mile broad ; a river flows through this sandy neck and runs into the sea on the eastern side ; this, when it is swollen, gives Mahia the appearance of an island ; on the outside of this neck, which is W.N.W.  $5\frac{1}{2}$  miles from Table cape, there is anchorage with south-west winds a mile from the beach.\*

**Wangawai Road.**—On the north coast of the peninsula, 3 miles West of Table cape, there is a good roadstead off the Wangawai river,

\* See Admiralty chart, Poverty bay to cape Palliser, No. 2,528 ; scale,  $m = 0.25$ .

affording shelter in south and west winds ; the anchorage is in 10 fathoms mud, Table cape bearing E.  $\frac{1}{2}$  S., and one mile north of the river ; it is safe during the ordinary sea breeze, but care must be taken to leave on the approach of easterly winds. The schooner *Governor Hobson* was swamped and all hands perished, in 1845, here, by holding on too long. She was driven on a patch of shifting sand—breaking in 5 fathoms—one and a half miles N.W. of Wangawai, and about  $\frac{3}{4}$  of a mile off shore.

Small coasters can enter Wangawai, as it affords anchorage in 6 feet ; from thence to Table cape the ground is foul, and rocks awash extend from the shore north of the cape nearly one mile.

Table cape, the N.E. extreme of Mahia peninsula, is 21 miles S. by E.  $\frac{1}{2}$  E. from Young Nick's head, from it the east coast of the peninsula trends S.S.W. 12 miles to its extreme point, and is studded with off-lying dangers. The first of these dangers is a reef three miles S.W. of the Table cape, extending three-quarters of a mile from the shore off Taiporutu. One mile farther south is a detached reef three and a half miles long ; the outer ledge two miles from the shore, and leaving a channel within, half a mile broad, sometimes taken by coasters, but not recommended ; the northern extremes of the Hawini rocks are six feet above water, the rest covered and only occasionally break. Three miles S.E. by S. of this ledge is a sunken rock seen by Captain Cook ;\* the true position of this isolated danger is  $3\frac{3}{4}$  miles E. by N. northerly of the south point of the Mahia peninsula, and  $4\frac{1}{4}$  miles N.E. of the south extreme of Portland island ; 20 fathoms will be found within one third of a mile round it. Another reef exists midway between this danger and the extreme of Mahia ; it appears to be a narrow ledge extending one cable north and south, and a channel within ; its centre is two miles E. by N.  $\frac{3}{4}$  N. from the south extreme of Mahia : these rocks have at least eight feet of water on them, and only break when there is a swell.

**PORTLAND ISLAND.**—South of Mahia peninsula extreme one mile is Portland island (*Te Houra*), so named by Cook from its resemblance to the well-known headland in the English channel ; it is nearly two miles in length in a N. by E, and S. by W. direction, of moderate height, and has a flat summit with a few bushes on it. A channel, one quarter of a mile in width, with 6 fathoms, exists between the peninsula extreme and Portland island ; this channel borrows on the Mahia shore, but the rocks extending off either coast show : if a vessel is caught in a southerly gale and cannot weather Portland island this channel is available, but as it leads among the rocks before described, it cannot be recommended. The tide sets through with a force of 2 knots.

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\* Cook thought its distance was only two miles from Portland. The coasters call it six.

The south extreme of Portland island is foul, but not extending more than half a mile from the shore.

**COAST NAVIGATION.**—From the preceding remarks it will be noticed that the east coast of the North island from the East cape to Hawke bay, a distance of nearly one hundred miles, has only two roadsteads for ships of burthen, viz., Poverty and Tolago bays; and although coasters do sometimes anchor in Open and Tokomara bays, yet these can only be approached in fine weather, and do not deserve the name of anchorages; also that the coast has many dangers within a league of it, and that even in fine weather and with westerly winds there are few spots where cargo can be shipped by vessels anchoring cautiously off the coast.

There are indeed few places, if any, where even coasting vessels would be safe in a gale, for the rivers are only accessible in fine weather at the proper time of tide.

**Soundings.**—Besides carefully avoiding the Ariel rocks, and the off-lying dangers from the Mahia peninsula, a stranger should not approach the coast thus described nearer than a league; the position of a vessel can be well determined by the soundings, which will be found to decrease from about 40 fathoms, at two leagues off shore, to 24 fathoms at one league off; the bottom being green mud outside 24 fathoms, and fine sand within that depth.

**Tides.**—Advantage can be also taken by standing off or in shore according to the tide, which is felt to a distance of 15 miles from the coast; within 4 miles of the shore the springs run 2 knots and the neaps one knot an hour; near the projecting headlands they will be found more rapid, and either tide, striking against a point, has a tendency to set off it.

#### FROM MAHIA OR TERA-KAKO PENINSULA TO CAPE PALLISER.

The coast from Mahia peninsula to cape Palliser, a distance of 180 miles, is still more destitute of shelter than that just described; and with the exception of a few fine-weather anchorages in Hawke bay, there may be said to be none along this whole extent of coast line.

**HAWKE BAY** is an extensive inlet, the distance from Mahia peninsula, its northern limit, to cape Kidnappers, its south extreme, being 42 miles in a north-east and south-west direction, the depth of the bay being 22 miles; it is entirely open to south-east winds, and affording no shelter beyond temporary anchorage. Of these anchorages the principal are off Long point on the west side of Mahia peninsula, at Ahuriri, and at cape Kidnappers. Long point affords shelter during north-east and south-east gales, and cape Kidnappers in south-westerly.

**Long Point Road.**—Long point Roadstead, on the north-east extreme

of Hawkes' bay, is sheltered from all winds but westerly. The holding ground is not always good, but by anchoring a mile from Long point and bringing it to bear S.S.W., there is good protection from the black north-easter,\* and ample room to weigh.† To ride out a south wind, it is requisite to get well and close inside Long point, until an opening or cleft shows itself; bring the point to bear south-west, in seven fathoms blue clay, this is the best holding ground. The cliff within the point is steep-to, but vessels should be prepared to take an outer berth when the gale abates, and if a south-west wind sets in, to proceed to Wangawai road.

**Water.**—Long point affords an excellent supply of water.

**Anchorage** for small vessels will also be found under Black reef point, which lies nearly midway between Long point and Portland island, and under Waikokupu, near the western shore of the sandy neck of the peninsula; but their partial shelter is only adapted to those coasters who are accustomed to take up the berth.

**Rivers Wairoa and Mohaka.**—Twenty miles to the westward of Long point, on the north shore of Hawke bay, is the entrance to the river Wairoa,‡ and 11 miles farther to the south-westward is the small river Mohaka; the former river can be entered by a vessel of from 30 to 40 tons, and the latter by vessels of 10 tons, but the entrances are difficult; the mouths also shift, and a south swell detains them with the chance of being blocked up.

**Tides.**—It is high water, full and change, at Wairoa river at 6h. 45m.; springs rise 7 feet, neaps, 4 feet.

The anchorages off these rivers are available in fine weather, but a heavy ground swell sets into the bight of the bay. On the approach of a south wind it has appeared ready to break in 12 fathoms.

Eleven miles to the south-westward of Mohaka, and under the highest bluff, is the small boat harbour of Waipapa, and 7 miles farther, the small headland Whakaari, which affords partial shelter for small coasters.

\* It frequently blows from the north-west in Hawke bay, while it is north-east at Long point; the neck of low land causing the in-draught. The black north-easter is so called as distinguished from the summer sea breeze from the same quarter.

† See page 115, Dangers in Hawke bay, for a shoal patch of  $2\frac{1}{2}$  fathoms near Moemoto Head.

‡ We found the Wairoa, a considerable river, had changed its mouth within the last three years, having shifted  $1\frac{1}{2}$  miles to the eastward. The entrance is very difficult, but within it has a depth of 12 to 14 feet, and navigable for boats 12 miles.—Commander Drury, in New Zealand Government Gazette, July 5, 1855.

The entrance of the river is narrow, and has a considerable bar; the tides run 6 or 7 knots, there is consequently great difficulty in entering with boats. It is a fine river inside, and there seems to be a fair amount of good land where the settlement is being formed.—Remarks: Commander Freemantle, H.M.S. *Eclipse*, 1866.

Whakaari forms the north extreme of a sandy bay, 8 miles in extent in a southerly trend, terminating at Alhuriri, port Napier.

**AHURIRI or PORT NAPIER.**—This port is adapted to vessels drawing 10 or 11 feet water; it is the only harbour deserving the name between Tauranga and port Nicholson, and is capable of considerable improvement. The south head is a clifty bluff, which, rising out of the low land, appears like an island; the entrance is narrow, but when inside it expands into a large sheet of water.

**Ahuriri Roads.**—The anchorage is in 6 fathoms good holding ground, about one mile off the harbour entrance, with the bluff just described, bearing S.E., by E., cape Kidnappers being shut in. These roads are safe in south, south-west, and north-west winds, and during the ordinary summer north-east sea breezes, which are termed the black north-easters, give ample warning of approach.\*

Commander Sullivan, H.M.S. *Harrier*, remarks: "We found the anchorage anything but safe with southerly or south-west winds, a tremendous swell setting into the bay; causing ship to roll 33°. On the 23rd April, best bower cable parted abaft the bitts; force of wind at the time, 4, S.S.W."

**LIGHTS.**—A fixed *white* light, 160 feet above the level of the sea, is shown from a tower 20 feet high on the eastern side of Napier bluff, half a mile south of the extreme point, and should be seen from a distance of 18 miles in clear weather; also a light, visible 8 or 9 miles, is placed at the entrance of the port on the west extreme of the eastern spit; it shows *red* in the direction of the Pania rock and *white* when clear of the rock. Vessels coming from the southward will find this light no guide to them.†

**Caution.**—Vessels must be careful not to mistake the white sector of the light on the spit at the entrance of the port for the light on the bluff.

**Pania Rock.**—In approaching Ahuriri roads care must be taken to avoid the Pania rock, a danger with only 8 feet on it, bearing N. by E.  $\frac{3}{4}$  E. from the bold white cliff of the bluff, 2 miles distant; the bottom is uneven to the north of this reef.

**Buoy.**—A *white* conical buoy lies in 9 fathoms water at about a cable S. by W. from the Pania reef, with the bluff bearing S.S.W. nearly, distant 2 miles. The average depth on the reef is 12 feet, but there are several rocky ledges with only 7 and 8 feet water on them.

**Auckland Rock.**—The buoy on Auckland rock has been removed in consequence of its having been so frequently washed away; it will not be replaced. The depth on the rock at low water is 18 feet; from it the bluff bears S. by E., west point of bluff S.W. by S.; cape Kidnappers S.E.  $\frac{1}{2}$  E.

\* See Admiralty chart, Ahuriri road, No. 2,513, scale,  $m = 10\cdot0$ .

† The information as to the light at the entrance to port Napier is from the New Zealand Almanac, 1874.

**Mooring Buoy.**—A mooring buoy lies in 6 fathoms water, in the south-west part of the roads W.N.W. from the bluff, and about a mile from the shore. The moorings are placed in the best holding ground, and are sufficiently strong for a vessel of 1,000 tons.

A strong set of moorings are about to be laid down for the use of ships loading wool.

**Water.**—The only fresh water available for ships within 3 miles of the entrance to port Napier is from a tank which holds about 16 tons of rain water. The surf on the bar renders watering a precarious operation.

The following remarks on port Napier, by Commander Drury, resulted from his visit in March 1855, as given in the New Zealand Government Gazette:—

“We arrived in Hawke bay, anchoring W. by N. one and a half miles from the Bluff; we remained at the roadstead off Ahuriri ten days, and at one time I was in great hopes of getting into the harbour, having found it deeper than usually reported, there being a depth of  $12\frac{1}{2}$  feet at high water, at the shoalest part. The tides are rapid, but by leaving the roadsteads at or near slack high water there is little difficulty in entering.

In the New Zealand Government Gazette of January 4, 1856, Commander Drury again remarks,—

“We found considerable change in the entrance to Ahuriri since March last, but not less water; the Rangatira bank is now connected with a low spit extending from the south shore, about one-third of a mile north of the mouth.”

“**Entering Port Napier.**—The present leading marks may not always be correct; it is said the Rangatira bank is affected by the freshets. On entering or leaving the harbour, it must be remarked that the flood sets across the entrance to the eastward; therefore, on passing the point, steer for Meanee point, and the deepest anchorage is immediately inside it. On leaving the harbour it must be remembered the ebb sets to the westward, directly towards the Rangatira bank. The flood streams runs in nearly two hours after high water to cover the extensive flats. The strength of the tide at the entrance is 6 to 7 knots. The proper time to approach is when it is high water by the beach; there will then be sufficient stream to enter. Vessels drawing 6 to 7 feet water should anchor off M’Kain’s hotel, as there is less tide there.

**Tide.**—It is high water, full and change, at port Napier, 7h. 50m., rise and fall, 3 feet.”

The town of Napier and buildings round the port are rapidly advancing, and the communication with the settlements of the interior being so simple, both by land and water, this fertile district will become of great



importance, and the exports must soon be considerable. The population of Napier in 1871 was 2,179.

The inland navigation near Ahuriri is a great natural acquisition to this province, besides the Ahuriri.

**Aspect.**—The aspect of the country in Hawke bay is mountainous on the north, with fine valleys at Wairoa, Mohawka, and Whakaari, and these are the timbered districts. South of Whakaari will be found impassable white cliffs, backed with undulating downs of curious formation, from the extreme regularity of the rises and hollows.

**Winds and Climate.**—Hawke bay has a fine climate; but the winds are very uncertain, and the sudden south-easters make it necessary to be cautious when trading off Wairoa and Mohaka:—the southers give more warning, by an overcast sky, but they are violent, especially in the winter. The westerly winds occur chiefly in October and November, blowing very strong with a low barometer, but generally fine weather. The black north-easter may be expected about once a month; this gale comes on very gradually, but latterly blows very hard, accompanied by rain, veering to north-west and south-west.

The ordinary summer wind is a fine north-easter, with hazy weather, setting in at 10 a.m., and dying away at sunset, and succeeded by a land-wind. The barometer rises to north-east, south-east, and south winds, and falls to north, north-west, and westerly winds. Rainy weather may be expected with north winds, and the black north-easters, and often with south-east winds; sometimes dry south-easters last for many days.

**Tides.**—High water full and change, at Long point, 6h. 0m. Springs rise, 5 feet; neaps, 4 feet. The tides in Hawke bay are slack, but strong in the river mouths. The flood sets in from the south, ebb from the north.

**Whaling Stations.**—There were (1856) eight whaling stations working on the west coast of Mahia peninsula, 22 Europeans, the crews Maories. There are settlers at Wairoa and Mohaka, the former being the Mission station. The whaling stations at Whakaari and cape Kidnappers are at present deserted; the trade is annually decreasing, the whales becoming scarce.

**AHURIRI to CAPE KIDNAPPERS.**—From Ahuriri bluff a sandy beach extends 10 miles to the southward; the rivers Nga-ra-ruro and Tuki-Tuki disembogue respectively 5 and 8 miles from the bluff; the former running from the eastward intersects the province, and is navigable many miles into the interior; the Tuki-Tuki has a changing bar but is navigable 12 miles for boats.

**CAPE KIDNAPPERS** projects 3 miles to the eastward; this is a high

point with white cliffs (argillaceous clay) on either side of it and two remarkable white rocks off the extreme. Cape Kidnappers anchorage is the shelter afforded by a reef extending from a point one mile westward of the cape; the best anchorage is a mile south-west of the extreme. Here a vessel can ride out south-east and south winds—the anchorage has otherwise little to recommend it; the landing is bad, and no water or stock can be procured.

**Dangers in Hawke Bay.**—So far as Hawke bay has been examined, there is deep water all over it; there are from 40 to 70 fathoms across the entrance, a general depth of 20 to 30 inside, and 7 to 12 fathoms one and a half miles from the shore. The following dangers are alone known to exist;—a shoal patch of  $2\frac{1}{2}$  fathoms N.N.E., one and a quarter miles from Long point, and 3 cables S.W. by W. from Moemoto head; and the Pania Rock off Ahuriri bluff, already noticed. The ground off Mohaka river is also foul.

**CAPE KIDNAPPERS to CAPE TURNAGAIN.**—From cape Kidnappers to cape Turnagain, a distance of 56 miles, the trend of the coast is S.  $\frac{1}{2}$  W., offering no remarkable or striking feature; a sandy beach extends 9 miles from the point, and the small island Motu-Kura (or Bare island) one and a quarter miles from the coast is 13 miles from it; the Capstan rock, above water, lies three-quarters of a mile S.W. of Bare island.

Southward of Bare island the coast is rocky, with some detached patches lying nearly a mile off shore; 9 miles distant from it is the Manawarakau river and Pah, with a sheep station near; a reef of rocks above water lies immediately off the mouth of this river, extending north and south for one mile; 8 miles south of Manawarakau is Tungara cove, where there is anchorage for coasters, but it is considered dangerous, and seldom resorted to; a reef of rocks extends off each point of this cove, and it is rocky within.

**Oputu or Shoal bay**, a slight indentation of the coast, commences 3 miles to the southward; and its southern extreme, called Black head, which is 7 miles from Tungara cove, is a clifty point, with rocks extending half a mile from it, these rocks fringing the shores also for a distance of 3 miles to the northward; from this clifty point a sandy bay, backed by sandhills, extends 4 miles to the southward; in the northern part of this bay a small islet lies half a mile from the shore; at the southern end of the bay is the river Parangahau, and 14 miles further south is Te-Poro-Poro, or cape Turnagain of Cook.

**CAPE TURNAGAIN** is a well-marked clifty projection, making as a white bluff from the northward, and as table-land from the southward; the coast to the southward of it recedes for some miles to the westward,

forming a bay open to the south-east; another hill, the chalk Nipple, so called from its white appearance, rises immediately over the coast 3 miles to the northward of the cape; there is a mile of beach close to the north of the cape, where boats may land in moderate weather.

From cape Turnagain the direction of the coast is S.S.W. for 30 miles to Castle point; the shore is frequently faced with rocks; the hills slope gradually; there are small wooded valleys, but the country generally is hilly, (from 500 to 1,200 feet,) apparently covered with natural grass; no dangers are known to exist more than one and a half miles from the coast, but the observation, that no stranger should approach the land to the northward of Hawke bay within a league, is equally applicable to the coast between it and cape Palliser.

**Soundings** in 30 fathoms mud were obtained 3 miles from the shore, and 60 fathoms at 6 miles; at a distance of 13 miles from cape Turnagain the soundings are 100 fathoms, sand bottom.

**CASTLE POINT** is a rock nearly detached from the shore, with a sandy bay 2 miles long to the northward; from the north it presents the appearance of a square tower at the extreme of a low point.

**Soundings.**—10 miles from the shore there is 60 to 70 fathoms; between this and 12 miles distant, it shelves into 200 fathoms green mud.

**FLAT POINT.**—24 miles S.S.W. of Castle point is Flat point, a low projection with a sandy tongue running a short distance out, and a rocky ledge extending one mile from it to the northward.

Flat point and the coast for the distance of 12 miles south-west of it, is fronted with outlying sunken rocks, extending in places  $1\frac{1}{2}$  miles from the shore. H.M.S. *Eclipse* in December 1864, found one awash at one and a half miles E. by S.  $\frac{1}{2}$  S. from Flat point; also a reef  $2\frac{1}{4}$  miles from this rock running in a north-east and south-west direction, nearly  $2\frac{1}{2}$  miles, Flat point bearing from it S.W.  $\frac{1}{2}$  S. 2 miles. The Kahau rocks, a small cluster above water, lies one mile off shore, with a depth of 49 fathoms one and a half miles to seaward; they are distant 9 miles from Flat point, and 29 from cape Palliser.

From Flat point to cape Palliser is S.W.  $\frac{1}{2}$  S. 40 miles; the coast line is itself low, formed of sand and shingle beaches with rocky points, and ledges extending in places one mile off shore; the depth of water being 48 and 50 fathoms,  $2\frac{1}{2}$  miles from the land; the ranges of hills, which generally run parallel with the coast a short distance inland, are moderately high, (the seaboard presenting a succession of level table steppes) and increase in elevation as cape Palliser is approached, where a high steep and sterile mountain range within two miles of the extreme of the cape, attains an elevation of 2,850 feet.

**CAPE PALLISER** is the south extreme of the North island of New Zealand, and the south-east entrance point to Cook strait; it forms a remarkable bold-looking promontory from a distance, but as it is approached, two low shelving points will be seen to extend from it to the southward; a reef, partly above water and awash, runs half a mile from the eastern of these two points, and the Black rocks, 15 feet above water, extend one mile from the western; strong tide riplings also extend one and a half miles from the cape, and vessels should not round it within two miles, even in fine weather; at this distance will be found 35 fathoms, sand and shells.

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## CHAPTER IV.

## COOK STRAIT.

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 VARIATION IN 1875.

Port Nicholson, 15° 25' E. | New Plymouth, 14° 55' E.

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## CAPE PALLISER TO NEW PLYMOUTH (TARANAKI).\*

The navigation of Cook Strait,—separating the two principal islands of New Zealand,—and which is daily increasing in importance, was up to a late period considered very formidable to the mariner, and perhaps not unjustly so. The accounts of the early navigators, the strong winds, and at times furious gales which the locality, and the configuration of its shores, render it liable to, the rapid tides and races, and above all the want of an authenticated survey, tended to confirm the impression, and to magnify the dangers which do exist, as well as to add many imaginary ones.

There are however in reality but few actual dangers; the southern shore abounds in secure harbours, easy of access either in north-west or south-east gales, which are the prevailing and indeed the only winds that blow with any violence; with the present charts, and by observing proper caution and vigilance, Cook strait may be navigated with confidence. It is the high road for ships from the westward bound to Wellington and Nelson, or to the new settlements, on the east coast of the Middle island; and vessels from Australia to England by the way of cape Horn frequently pass through it, as they generally calculate on a north-west wind, with the advantage of being able to complete their stock of water and refreshments at Wellington, preferring this direct course to that of making the passage to the northward of the Three Kings islands, or to the southward of Stewart's island.

Having in the last chapter conducted the seaman along the eastern coast of the North island, the description of Cook strait from its south extreme will be here commenced, taking in the first place its northern outline, with the harbour of port Nicholson, on whose shores stands the rising town of Wellington, and now the seat of government.

From a position 2 miles distant, and abreast the black rocks off cape Palliser, a W.N.W. course for 24 miles will take a vessel to the entrance

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\* See Admiralty charts, Nos. 2,054, 2,616, being sheets 5 and 7 of New Zealand coasts; scale,  $m = 0.8$  inches.

of port Nicholson, passing Taourakira and Baring heads at the same distance. Barret reef will then bear N. by E. 4 miles, and the entrance of the port will be open.

**PALLISER BAY.**—Palliser or Useless bay is a deep indentation of the coast between cape Palliser and Taourakira head; its distance across is nearly 18 miles, and its depth 8 miles.

**Caution.**—This bay is perfectly open to southerly and south-east winds, and vessels should be very careful not to get embayed, as sudden shifts of wind to these quarters are not uncommon when it would be a dead lee-shore, with no shelter; there are from 10 to 14 fathoms within 2 miles of the beach, but the holding ground is bad, and a heavy sea soon gets up.

From the head of Palliser bay the fine valley of the Wairarapa extends in a north-easterly direction; it contains about 350,000 acres of level grazing land, and is connected with other grassy plains extending to Hawke bay on the eastern, and the head of the Manawatu river on the south-western side of the North island of New Zealand. The Ruamahunga river, after traversing this valley, loses itself in two extensive but shallow lakes, whose accumulated waters during the winter months force a passage through the narrow sand bar which separates them from Palliser bay; these lakes extend 15 miles in a north-easterly direction from the head of the bay, and are navigable for boats, that may afterwards ascend the Ruamahunga 20 or 30 miles; numerous settlers are established in the Wairarapa valley.

**TAOURAKIRA HEAD** is a bold headland, with the Rimutaka mountains extending from it in a north-easterly direction along the west side of Palliser bay; of this mountain range, the Hump, 3,400 feet high, is 3 miles from Taourakira head; and mount Francis, 3,800 feet, lies over the north-west angle of the bay.

The outline of the land at the back of Taourakira head is more regular than that of cape Palliser, and, approaching from the eastward, it appears from a distance to end in a bold abrupt convexity; on a nearer approach, a low point will be observed extending from its base, which gives it much the appearance of the snout of a porpoise; low detached straggling rocks extend off Taourakira head one-third of a mile, and continue almost the same distance from the coast as far as Baring head;—the Orong-orong river flows into the sea between these two heads.

**BARING HEAD** is nearly 3 miles W.N.W. from Taourakira head, and is a flat table point, at the extremity of terrace land, extending towards Pencarrow head;—detached rocks above and below water extend from it about one-third of a mile.

**FITZROY BAY and Anchorage.**—Between Baring and Pencarrow heads is Fitzroy bay, a slight indentation of the coast only, where vessels waiting to enter port Nicholson sometimes ride out a north-west

gale, by standing sufficiently near the shore to shut the entrance in by Pencarrow head, but keeping the southern part of Barret reef just open of the rocks off that head; this gives a berth half a mile from the beach in 10 to 12 fathoms.

#### PORT NICHOLSON.

**PENCARROW HEAD.**\*—Pencarrow head, N.W. by N., 3 miles from Baring head, is the eastern entrance point of port Nicholson, it is a bold cliff, with a lighthouse on its summit.

**LIGHT.**—The light on Pencarrow head is a *fixed white* light of the second order, placed at an elevation of 420 feet above high water, and in ordinary weather should be visible at a distance of 30 miles. From the lighthouse, Baring head bears S.E. by S.  $3\frac{1}{4}$  miles, and Sinclair head W. by S.  $\frac{1}{2}$  S.  $6\frac{1}{2}$  miles.† Low straggling rocks, above water, extend off this head nearly two cables.

The western entrance points to port Nicholson are formed by a high peninsula almost separated from the main land by Evans bay on the harbour side and Lyall bay to seaward, the low sandy neck separating these bays being scarcely half a mile across.

Approaching port Nicholson from the southward or eastward, this peninsula from a distance appears like an island, and in consequence Lyall bay has frequently been mistaken by strangers for the true entrance.

**PALMER HEAD**, the eastern extreme of the peninsula just described, is the western entrance point of the port; the land over it is moderately high, and it bears from Pencarrow head W.N.W. one and a half miles, with a reef of rocks called the West ledge extending off it to the southward nearly three-quarters of a mile; these rocks are all above water, or awash, and may be approached with perfect safety within a quarter of a mile carrying 10 and 12 fathoms.

**Pilot.**—The pilot's house is in a cove immediately to the westward of this head, and he will, weather permitting, always come off to a ship on her hoisting the pilot signal. (For the New Zealand general harbour signals, see page 13.)

Between Palmer head and Dorset point, the next projection, distant one mile N.E. by N., stands the Barrel beacon on an elevation of the land.

**Barret Reef**, which constitutes the chief impediment to the entrance of the harbour, is a cluster of rocks principally standing well out of water, lying nearly in the centre of the passage, and extending a little more than

\* See Admiralty plan, port Nicholson, No. 1,423; scale,  $m = 3\cdot0$  inches, by Captain Stokes, and Officers of H.M.S. *Acheron*.

† Pencarrow lighthouse opens on an E. by N.  $\frac{1}{2}$  N. bearing coming from the north-westward, N.W.  $\frac{3}{4}$  N. coming from the eastward.—Remarks by Mr. E. W. Creak, Master H.M.S. *Esk*, 1865.

half a mile in a N. by W. and S. by E. direction, with an average width of about a cable. There are 7 fathoms within half a cable of these rocks, and no off-lying dangers; their southern extreme is a black rock 10 feet out of water, which may be rounded within a cable in 9 fathoms: from this rock Pencarrow light bears S.E. by E.  $\frac{1}{2}$  E. one mile.

**Chaffers Passage.**—The broadest and usual passage is to the eastward of Barret reef, although there is a channel, called Chaffers passage, to the westward; this latter channel is 3 cables wide, with a depth of from 7 to 10 fathoms, but being tortuous in its direction, it is in general only used by small vessels with a leading wind.\*

**The Main Channel,** or that between Pencarrow head and Barret reef, has a clear breadth of not less than 6 cables for a distance of one and a half miles; that is, from the southern end of Barret reef to abreast the Steeple rock, which lies on the west shore off the northern extremity of Dorset point.

**Caution.**—All the points of the coast on the eastern side of the entrance have straggling rocks awash extending a cable off them; vessels working in should be cautious in approaching close to this shore, as in the event of missing stays they are in great danger from these out-lying rocks; the British merchant ship *Inconstant*, of 600 tons, struck in this way, and but for the timely assistance of H.M. Surveying steam vessel *Acheron*, would have gone to pieces.

**Dorset Point.**—From this point a reef similar in feature to Barret reef extends to the south-east nearly 3 cables; and from the northern extreme of Dorset point another reef, of which the remarkable Steeple rock is the extreme, extends to the north-east for 2 cables; and off Steeple rock a cable, in a north-easterly direction, is a rock with 9 feet on it at low water spring tides; the distance between the extremes of these two reefs is nearly three-quarters of a mile, and vessels working up may stand on until in a line between them having then 21 feet at low water.

**Worser Bay** is on the western shore, half a mile above the Steeple rock, where a vessel may anchor if necessary in 5 fathoms, a quarter of a mile from the beach.

After passing Steeple rock there is a clear working channel of more than a mile, with from 6 to 12 fathoms between the western shore and Ward island; the points on the western shore may be approached within a cable.

**Ward Island,** a small yellow coloured clifty island, lying on the eastern side of the channel,  $2\frac{1}{2}$  miles above Dorset point, and one and a quarter miles from the western shore, has shoal water extending from it to the west and south-west nearly half a mile, leaving the breadth of the passage between

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\* Chaffers passage is not used even by steam coasters, as several sunken rocks are said to exist in it, the positions of which are not known.—Remarks by Nav. Lieut. J. E. Petley, H.M.S. *Dido*, 1872.



the shoal water and the western shore little more than three-quarters of a mile. To avoid this danger, known as the Hope shoal, vessels with a leading wind after passing the Steeple rock and its outlying danger should keep the western shore on board within half a mile; by steering for the western extreme of Somes island, or keeping that island a little on the starboard bow, it will also be well cleared. This part of the channel is reported to have shoaled to  $5\frac{1}{2}$  and 6 fathoms.

**Hope Shoal and buoy.**—In working in, the western side of Ward island should not be approached within a long half mile; at nearly that distance the water shoals suddenly from 8 fathoms to 16 feet, and in one spot to 10 feet; when the north end of the island bears East, the shoal is passed, and the shore is then bold. A *red* buoy in 16 feet water marks the west side of this shoal.

There is a passage between Ward island and the eastern shore which is available for small vessels, the least depth of water being 14 feet.

**Halswell Point** is the north extreme of the peninsula on the western shore, and is 3 miles northward of Dorset point; on rounding it, the town of Wellington will be opened out; Pipitea point, a low sandy point, (the north-west limit of Lambton harbour,) bearing west 2 miles; rocks extend a cable off Halswell point, which are marked by a *red* buoy in  $5\frac{1}{2}$  fathoms.

**Evans Bay** is immediately round Halswell point running nearly  $2\frac{1}{2}$  miles to the southward. Jerningham point (its western point, as also the north-east entrance of Lambton harbour), has a rocky patch of 9 feet lying nearly a cable from it, in a north-east direction, and is marked by a *red* buoy in  $5\frac{1}{2}$  fathoms; Evans bay has an average breadth of more than half a mile, with no dangers, and deep water all over; 20 feet at low water will be obtained three cables from the sand beach at its head.

Vessels occasionally come here to repair, preferring it to Lambton harbour for that purpose, as it is equally if not better sheltered from north-west and south-east winds, from being more confined; with north-east winds, which are unusual, a swell sets in. A patent slip has been constructed, and buoys are laid down for swinging ships in this bay.

**LAMBTON HARBOUR.**—After passing Halswell point, a vessel may steer W. by S., for the Government house flagstaff (about 2 miles distant,) anchoring in the harbour as convenient; 4 and 5 fathoms, mud or sand will be found a quarter of a mile from its shores, and outside that distance from 6 to 9 fathoms; a good berth is with the Government flagstaff bearing about N.W., and the Waterloo inn,—a large white building on the extreme of Kai-warra point,—just over the low sandy point of Pipitea (Kai-warra is one mile north of Pipitea), a vessel will then be in 4 fathoms, mud, a quarter of a mile off shore; inside this line the water shoals rather suddenly.

Pipitea point must not be approached within a quarter of a mile, as a sand and shingle shoal with 6 feet water extends from it one and a half cables; there is a watering place at this point, as also another at the head of the harbour from small streams.

A large pier has been built off the custom-house having deep water at the outer berths (23 and 27 feet), and warehouses with presses for wool and flax. Three triangular *red* lights are shown off the end of the pier.

**Water.**—The jetty abreast of Government house has been considerably lengthened, and water may be obtained from a pipe led under it.

**Time ball.**—By information dating October 1873, a time ball has been established and is dropped at noon from a pole erected at the custom-house.

**Hutt River.**—This river, after flowing through the pretty and fertile valley of the same name, runs into the head of port Nicholson, through the eastern extreme of a sandy beach two miles in extent; its embouchure is 6 miles from the anchorage at Lambton harbour, and 2 miles N.E. from Somes island; it is navigable for nearly 2 miles, or as high as the bridge for large cargo boats; the sandy beach may be approached within three cables in 4 fathoms; within this depth the soundings are irregular.

The extensive sheet of water in the northern part of port Nicholson, and of which Lambton harbour forms but a small portion, is free from dangers, with an average depth of from 10 to 15 fathoms.

**Somes Island,** lying about the centre of the port, is a cliffy island 250 feet high, about half a mile in length north and south, and a quarter of a mile in width; detached rocks extend off the north end a quarter of a mile; otherwise it may be approached within a cable carrying 7 fathoms.

**LIGHT.**—On the south point of Somes island is a *white* octagonal iron lighthouse, from which, at an elevation of 75 feet above the level of high water, is exhibited a *fixed* light, showing *white* in mid-channel, *red* on the western, and *green* on the eastern shore of the main entry to the port. The light is intended as a leading light for vessels entering the port by the main channel entrance, and in clear weather should be seen a distance of 10 miles, or 4 miles outside Pencarrow head light.

From the lighthouse the centre of Ward island bears S.S.E.  $\frac{1}{2}$  E.; Pencarrow head S.  $\frac{1}{2}$  E.; Steeple rock South; Halswell point S.W.  $\frac{1}{4}$  S.; and Jerningham point S.W.

**Caution.**—Vessels entering port Nicholson at night, having arrived off Pencarrow head, and opened out the light on Somes island, must be careful not to change the white light on Somes island for *red* or *green* after bringing Pencarrow light to bear E.N.E.; until the *red* lights on the Queens wharf bear W.S.W., when a course may be steered to any part of the anchorage.

**Soundings.**—The soundings in port Nicholson have altered considerably since the last survey was made, but not sufficiently to interfere with the general navigation of the harbour; the bank extending from the shore in front of the town of Wellington has risen proportionably, therefore some allowance should be made by vessels desiring an in-shore berth.

**Tides.**—It is high water at full and change in Lambton harbour, port Nicholson, at 4h. 30m., rise of tide from  $2\frac{1}{2}$  to 5 feet; the strength of tide in the narrows at the entrance of the port, is from half a knot to 2 knots, but within it is much less. The flood stream outside the entrance sets to the northward, and the ebb to the southward, and runs six hours each way.

It is high water by the shore at the southern entrance of Cook strait at 6h. 0m.; but the flood or northerly stream commences at 3h. 0m. or three hours before, and runs until three hours after high water by the shore.

**GALES IN COOK STRAIT.**—Strong gales are so frequent in Cook strait, and changes of wind from north-west to south-east, and the contrary, are often so sudden that it seems desirable to offer a few remarks as to the most prudent course to be pursued by vessels under such circumstances both in entering port Nicholson and in passing through the strait.

Vessels arriving off the entrance of port Nicholson with a moderate north-west wind may work in by day or night, provided the weather is sufficiently clear to see the dangers, which are all above water, excepting the rock with 9 feet water on it, a cable north-east of Steeple rock; but should the weather be thick, or the light on Somes island not clearly distinguished, they ought not to attempt to enter at night, but stand off and on for daylight, or anchor according to circumstances, either outside Barret reef with the main entrance open, ready in case of a shift of wind; or in Fitzroy bay.

It frequently happens, however, that a strong north-west wind is met at the entrance, when most well-found vessels, with daylight, may work in against a double reef topsail breeze, but with a stronger wind few vessels would be able to work through the narrows; it then becomes a question whether to stand off under easy sail, or to anchor outside. If a vessel can fetch in above Pencarrow head, she might anchor with advantage in 10 or 11 fathoms and ride out the gale, but the entrance should be kept open, as sudden shifts from north-west to south-east often occur, and vessels have found themselves awkwardly placed under such circumstances; that is, by anchoring under the lee of Barret reef, with a north-west wind.

Better shelter for the time is doubtless obtained by anchoring in 9 or 10 fathoms between this reef and the West ledge extending off Palmer head, but this anchorage is not recommended; if adopted, a vessel must be prepared to weigh immediately the north-west wind lulls, or she will

be inevitably endangered by the one reef or the other, in the event of a shift to south-east.

Fitzroy bay must also be considered an eligible anchorage with a strong north-west gale, so long as it is not entered too far; for it has this advantage, that a vessel will be out of the tide, and in the event of a shift of wind to south-east the harbour can be run for.

With a south-east wind however strong, and clear weather, the port may be entered with perfect safety; if after nightfall (supposing the entrance to be well made out), the *white* light on *Somes* island will lead up the harbour, and when abreast of *Halswell* point, the lights of the town will open out, and W by S. will lead to the anchorage in *Lambton* harbour; under such circumstances a vessel should run in under easy sail, and anchor immediately 6 fathoms is obtained.

A vessel leaving port *Nicholson*, bound to the northward, or to any of the ports on the eastern side of the *North* island, and meeting a south-east gale before she is clear of *Cook* strait, had better bear up and run to the north-west, making the passage round the north end of the island. Vessels under these circumstances have frequently made a quick passage to *Auckland*.

If bound to the southward, provided the weather be sufficiently clear to make the land, *Cloudy* bay affords good shelter at its head, as also port *Underwood*, according to circumstances.\*

To a vessel entering *Cook* strait from the westward and meeting a south-east gale, port *Gore*, or *Guards* bay offer good shelter if she is far enough advanced to fetch them; if not she may run for port *Hardy*, or to the westward of *D'Urville* island for *Croisilles* harbour. With time and daylight permitting, this latter anchorage is to be preferred, for the heavy swell raised by the tides across the narrow entrance of port *Hardy* renders it more a steamer's than a sailing vessel's harbour.†

Prevailing Winds.—South-easterly gales are most frequent and blow with the greatest violence during the winter months of *May*, *June*, and *July*; a falling barometer is a certain indication; they come on very suddenly, last often three or four days, and are generally accompanied

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\* A steam vessel bound to port *Nicholson* through *Cook* strait and meeting a south-easter might make a good passage, by anchoring first in *Current* Basin, from there steaming through *French* pass and *Admiralty* bay before the first of the southerly stream commences, enabling her to have the whole of that stream after rounding *Francis* head; passing between the *Chetwode* islands and *Harding* point, steering close by *Motu Ngara* island and capes *Lambert* and *Jackson*. If after passing the latter cape there is a possibility of reaching port *Nicholson* during that tide she should stand over for the east shore of *Cook* strait, as there the tide runs stronger; if there is no chance of saving the tide, she had better go up *Queen Charlotte* sound for *Tory* channel, anchoring, if necessary, in *Oyster* bay, from thence she would easily reach port *Nicholson* the next favourable tide.—Remarks by Navigating Lieutenant *T. H. Tizard*, H.M.S. *Challenger*, 1874.

† See foot note page 148.

with rain and thick weather. North-west gales are more common in spring and summer; they are generally of short duration, but are exceedingly violent in the squalls; at their strongest they raise a high barometer.

**COAST WESTWARD of PORT NICHOLSON.**—Three-quarters of a mile westward of Palmer head is Lyall bay, which runs to the north for nearly a mile, terminating in a curvilinear sandy beach, with low land extending across to Evans bay; it is three-quarters of a mile wide, and has 6 fathoms in the centre, but is totally unfit for an anchorage, on account of the reefs which project off either point, and its exposure to the full force of southerly or south-east gales.\*

Immediately westward of the head of Lyall bay is mount Albert, 590 feet high, on which is a signal-staff, from whence the approach of vessels is telegraphed to the town.

**Reef islet** lies three-quarters of a mile westward of Lyall bay, and is surrounded by rocks; there is a boat channel of 20 feet between it and the shore.

**Sinclair head.**—Proceeding westward, Sinclair head, a high bold cliff, lies 5 miles W.S.W. from Palmer head, and has foul rocky ground extending nearly half a mile off it; the Happy valley peaks, one mile to two miles inland of it, rise to a height of 1,700 feet.

The intervening coast is indented with small sandy bays, and fringed with rocks, which extend off all the points from three cables to nearly half a mile; the land is moderately high, and increases in elevation to the westward.

From Sinclair head the coast trends to the W.N.W. towards cape Terawiti, which is  $6\frac{1}{2}$  miles distant; between these two headlands,  $2\frac{1}{2}$  miles westward of the former, is Tongue point, a low projecting point; between Tongue point and Sinclair head lie the following dangers to be avoided in approaching port Nicholson from the westward:—

**Karori, or Seal rock,** stands high out of the water; it bears from Tongue point S.W. half a mile, and is not connected with it, although a reef runs off that point for a considerable distance.

**Toms rock** is only just awash at low springs; it lies E.S.E. one mile from the Karori rock, and a quarter of a mile outside a line drawn from that rock to the extreme of the reef off Sinclair head, being a short mile from the shore, and immediately off the Karori stream. Karori rock in a line with the extreme of cape Terawiti, bearing N.W.  $\frac{1}{2}$  N., clears Toms rock  $2\frac{1}{2}$  cables to the westward; and Sinclair head extreme in a line with Pencarrow lighthouse, E. by N.  $\frac{1}{2}$  N., clears it 4 cables to the southward; therefore in passing to the westward, or entering port Nicholson from that direction, Pencarrow lighthouse must not be shut in of Sinclair head, or

\* See Admiralty chart, Cook strait to cape Egmont, No. 2,054; scale  $m = 0 \cdot 2$ .

the Karori rock be brought outside, or open of the extreme of cape Terawiti.

**Caution.**—A rock has been reported lying S.  $\frac{1}{2}$  W. two-thirds of a mile from Toms rock; the above-mentioned clearing marks lead nearly on the given position of this rock, therefore cape Terawiti should be kept well open westward of Karori rock, and Pencarrow lighthouse open to the southward of Sinclair head, when passing the coast between cape Terawiti and Sinclair head.

**Ripplings.**—There are 10 and 12 fathoms a short distance outside the Karori, and Toms rocks, but heavy tide ripplings with irregular rocky bottom extend two miles off them.

**CAPE TERAWITI.**—From Tongue point the coast is bold and cliffy to cape Terawiti; the land continues high until it descends into the Oterangi valley, which is close to the eastward of Terawiti hill and nearly isolates it. The cape is a remarkable bold headland, rising immediately from the coast into an almost semicircular hill; its well-marked convex outline, as seen from the northward or southward, renders it difficult to be mistaken; it is also remarkable as being the salient point on this northern side of Cook strait.

**DIRECTIONS for MAKING PORT NICHOLSON from the WESTWARD.**—Having described the dangers which exist immediately to the westward of port Nicholson, remarks are added for making the port coming from that direction.

The narrowest part of Cook strait is formed by cape Terawiti and Wellington head, the latter bearing from the former W.  $\frac{3}{4}$  N. 12 miles. It is high water in the centre of the strait here on full and change days at 8h. 0m.; the flood or northerly stream commences at 4h. 0m. and runs until 10h. 0m., the strength of the tide varying from one to 4 knots.

Heavy tide ripplings are experienced in the central part of the strait between these two heads, where there is uneven bottom, the depths varying from 80 to 122 fathoms sand. Tide ripplings also extend off cape Terawiti two miles, and for nearly three miles off Karori rock; eastward of Sinclair head these tide ripplings cease.

Running for port Nicholson from the northward or westward with a fair wind, cape Terawiti should be passed at a distance of from 2 or 3 miles, and the continuous coast not approached nearer until arrived between Karori rock and Sinclair head, when a vessel may haul gradually up towards the latter, (taking care to keep Pencarrow lighthouse well open,) and passing about one mile from the points of land to the eastward of Sinclair head, until Barret reef opens out, when she may steer boldly for the southern end of the latter, passing it if necessary within half a cable, as before described.

The course from the berth recommended off cape Terawiti is S.E. by

E.  $\frac{1}{4}$  E. for 7 miles to abreast Sinclair head, and from thence N.E. by E., or when Palmer head opens out, a ship will then be clear of the reported rock, nearly the same distance to Barret reef. During daylight all the outlying dangers can be seen except the Toms rock, and the rock reported to the southward of Toms rock.

**Caution.**—The tide between cape Terawiti and Sinclair head runs during springs 5 knots, and it is only with a commanding breeze that a vessel can stem it; hence it is necessary, particularly with the flood stream, to give the coast a berth of 2 or 3 miles, as unless great attention is paid to the steerage, vessels are in danger of being set too close to the detached rocks. Eastward of Sinclair head, and inside a line between it and Baring head, the tides are not much felt, and generally there is an eddy with the flood, setting to the eastward along shore towards the entrance.

**Overfalls** exist six and seven miles S.W. of Sinclair head; and the heavy rippings which occur during spring tides are highly dangerous to small coasters, especially at night, unless proper precautions are taken before entering them.

**COAST NORTHWARD OF CAPE TERAWITI.**—From cape Terawiti the coast turns abruptly to the N.N.E. towards the small harbour of Porirua, distant 16 miles, and is a rugged cliffy shore fronted with straggling rocks; at the distance of one and a half miles the soundings vary from 25 to 35 fathoms. Oharui bight lies 7 miles from the cape, and in moderate weather boats may land there, the distance by the road to the town of Wellington being only  $3\frac{1}{2}$  miles.

**PORIRUA HARBOUR\*** is only available for small vessels; but in fine weather, and with off-shore winds, large vessels may anchor within the line of the outer heads.

Nearly in the centre of the entrance, half a mile northward of the south head, is a cluster of rocks, uncovered 3 feet at high water, abreast which on either side are  $4\frac{1}{2}$  fathoms; within these rocks a bar of shoal water extends from north to south, having 9 feet a cable inside the inner rock, and 4 feet a quarter of a mile within it.

The harbour runs to the S.E. one and a half miles from these rocks, and at the distance of one mile narrows to scarcely two cables in width; coasters drawing 8 feet may enter at high water or three-quarters flood, and when over the shoalest part, which is little more than half a mile above the centre rocks, and only a cable across, the water deepens to 15 feet, and half a mile higher up to 5, 6, and 7 fathoms; here the harbour branches off into two arms, one running to the eastward, and the other to the southward.

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\* See Admiralty plan of Entry anchorage, Porirua harbour and Mana island, No. 2,588; scale,  $m=3\cdot0$  inches, by Captain J. L. Stokes, R.N., and officers of H.M.S. *Acheron*.

The outer anchorage for large vessels is in the bay immediately within the north head; but if the wind should shift to the north-west, it is necessary to proceed for the anchorage under Mana island or run for the strait.

Porirua harbour by land is 12 miles from the town of Wellington, with an excellent road the whole way.

**Tides.**—It is high water full and change at Porirua at 8h. 0m.; the rise of tide from 6 to 8 feet. The flood or northerly stream begins in the offing at 5h. 0m., and the ebb or southerly at 11h. 0m.

**MANA,\*** or Table island, is 13 miles N.N.E. of cape Terawiti; it is flat-topped,  $1\frac{1}{2}$  miles long, half a mile in width, and 440 feet high, and is covered with pasture; the northern and western sides are high and precipitous, with scattered rocks extending more than a cable off shore: on the eastern side the land is sloping; the south-east point is a shingle beach. In clear weather mount Egmont is visible from the north-west summit bearing N.W. by N., 112 miles.

Mana island lies nearly one and a half miles from the mainland, and is 2 miles westward of the entrance of Porirua harbour: a bar called the Bridge extends from its south-east point to the adjoining mainland one and a half miles to the south-west of that harbour; this bridge may be crossed in 21 feet at low water, by keeping a quarter of a mile from the point of the island, but deeper water will be found in mid-channel; there is generally a heavy tide rippling on the bridge, and the tides run from one to three knots.

**Anchorage.**—Anchorage will be found under the south-east end of Mana, to the southward of the Bridge, sheltered from north-west winds, one-third of a mile off the island point in 8 fathoms. H.M. ships *Calliope* and *Driver* both rode out strong gales from north-west at this anchorage.

**LIGHT.**—The lighthouse (red) on the North Bluff, the tower of which is 70 feet high from base to vane, is 450 feet above the mean level of the sea. The light is a *fixed* white light of the second order, and should be seen from a distance of 29 miles. The great height of Mana island light may often cause it to be obscured by fog.

**COAST NORTHWARD OF PORIRUA HARBOUR.**—For nearly 3 miles northward of Porirua harbour the coast is high and cliffy, with straggling rocks extending off shore fully half a mile;—Gibraltar, a high square rock standing close to the shore, with a reef outside it, being the northernmost; from hence the coast trends with a gentle curve and sandy beach to the northward for 11 miles to Waikanai, a native settlement on the bank of a small river, which is navigable for large boats at high water.

\* See Admiralty plan of Entry anchorage, Porirua harbour and Mana island, No. 2,588 m =  $\begin{cases} 4\cdot0. \\ 3\cdot0. \end{cases}$



There are from 10 to 14 fathoms one and a half miles off this part of the coast.

**KAPITI ISLAND**, (the entry island of Cook,) is a prominent object entering Cook strait from the westward; its south end bears from Mana island N.  $\frac{1}{2}$  E. 12 miles, and the nearest part of the mainland, (Waikanai river,) bears S.E.  $\frac{1}{2}$  S. 3 miles from its north end. Kapiti is 5 miles long in a north and south direction, or nearly parallel to the line of coast, and one and a quarter miles in width; it is wooded and mountainous, the highest peak rising to a height of 1,780 feet in the centre of the island; the western side is steep and precipitous, the hills rising abruptly from the sea; on the eastern side it slopes somewhat more gently towards the beach, and is intersected by deep ravines.

Long point, its north-east extreme, is a low rounding flat shingle point, extending nearly half a mile from the foot of the hills, with a small lake in the centre: close under this point there is shelter for a few small vessels from north-west winds, but they should not lie here with any sign of a south-easter; several coasters have been thrown on the beach and wrecked by doing so.

**Entry Anchorage**,\* at the south-eastern end of Kapiti, is formed by three small conical-shaped islets, which, together with the reefs extending off them, afford good shelter from south-east winds, and is protected from the north-west by Kapiti itself. The two southernmost islets, Hiko and Mahew, are each about half a mile in circumference, lie nearly one mile eastward of the south-east extreme of Kapiti, and within a cable of each other; a reef also encircles both, and extends for more than a cable to the southward of Mahew, the outer islet. Between Hiko and Kapiti there is a channel of a cable in width, with a depth of 15 feet.

Evans islet, or the Sugar Loaf, lies little more than a mile to the N.E. of Hiko and Mahew islets, and three-quarters of a mile from Kapiti: the Passage rocks exist midway between Evans islet and Kapiti; they are awash, and have kelp round them; there is a passage for large vessels on either side these rocks, but that between Passage rocks and Evans islet is narrow. A reef of rocks above water extends from Evans islet to the southward nearly 4 cables, with straggling rocks awash at low water off its extreme.

To enter the anchorage vessels must pass between the end of this reef and Mahew islet, the breadth of the passage being nearly one mile: the general depth of water within this boundary is from 17 to 12 fathoms; and with the centre of Mahew islet bearing South, distant 4 cables anchorage will be found in the latter depth, over sand and coral bottom,

\* See Admiralty plan of Entry anchorage, Porirua harbour and Mana island, No. 2,588 m =  $\begin{cases} 4.0. \\ 3.0. \end{cases}$

a quarter of a mile from the shore of Kapiti: inside this berth the water shoals rather suddenly. Extensive whaling establishments formerly existed on the islets, and whalers have ridden out the whole winter gales at this anchorage.

**Soundings.**—Between Kapiti and the mainland of the North island there is a general depth of from 20 to 30 fathoms, and the channel is clear of dangers, excepting the reefs which extend off the islets; one mile seaward of the island the soundings vary from 40 to 50 fathoms.

**COAST NORTHEWARD OF KAPITI.**—From Waikanai river the coast trends N.  $\frac{1}{4}$  E., with an almost straight sandy beach for 28 miles to the Manawatu river, the Otaki and Oahau rivers, navigable for large boats at high water, lying between, the former nine, and the latter 15 miles from Waikanai; there are besides several small streams always fordable.

At Otaki is a considerable native village, with a large and handsome church, famous as of native workmanship. Sandhills from 20 to 40 feet high fringe the coast from half a mile to one mile inland, when a fine and level tract of country extends to the foot of the near mountain range, a distance of 6 or 7 miles at Waikanai; this high range recedes to the eastward as it extends north, the level and fertile land about Manawatu river extending inland nearly 20 miles to its base.

**MANAWATU RIVER** may be known from the offing by a remarkable grove of trees on the north side, nearly 3 miles from the entrance;—and on approaching it two beacons, 50 yards apart, coloured *white* and *red*, will be seen on the northern extreme point; these beacons brought in line, bearing E. by S., lead in; they can only, however, be considered as temporary marks, being liable to be blown down by a gale, or removed by other causes, vessels entering should therefore depend on local knowledge, or anchor outside and examine the bar.\*

Manawatu river is easier of access than any other river on this coast, the channel being straight; and although the depth varies after heavy gales or floods, the bar has not been known to shift in direction. It is 250 yards across at the mouth, and a short distance inside becomes exceedingly tortuous in its course, intersecting the Rua-hine range, (a high chain of mountains extending north and south nearly through the centre of the island,) and branching off into many arms to the eastward; between one of which, and the Ahuriri river flowing into Hawke bay, there is said to be easy communication.

**Tides.**—It is high water full and change at Manawatu bar at 9h. 50m.; springs rise 8 feet, neaps 6 feet.

There is a depth of 5 feet water on the bar of the Manawatu at low

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\* The pilot shews the colonial bar and danger signals (page 13), and will guide vessels with the semaphore arm. From New Zealand Almanac, 1874.

water, and vessels drawing 9 feet may enter at high water and proceed fifty miles from its mouth.

**RANGITIKI RIVER**, the next river northward, is  $9\frac{1}{2}$  miles from the Manawatu. Coasters drawing 6 feet may enter at high water; and it is navigable for canoes or boats 50 miles; a mile above the entrance it is fordable at low water.

The land here is among the best in New Zealand; for many miles inland it is level and clear of wood, with excellent pasture for cattle; flax is also cleaned by the natives, and exported to some extent.

From Rangitiki river the land takes a north-westerly trend towards Wanganui river, which is 24 miles distant, the coast being of the same character as that already described, a sandy beach skirted with low sandhills. The small rivers Wangahu, and Turakini, lie to the southward of Wanganui, the former 5 and the latter 8 miles from it; they are about 20 yards wide at their mouths, and only navigable for boats, their bars being dry at low water.

**WANGANUI RIVER** entrance bears from the north end of Kapiti island N. by W. 52 miles; it lies in the depth of the great bight between cape Terawiti and cape Egmont, and about an equal distance from both.

In clear weather mounts Egmont, Tongariro, and Ruapehu\* are distinctly visible from it, when the best guide for the entrance is Tauperi (or the Devil's Thumb), a remarkable sharp double-peaked hill, 1,860 feet high, and about 18 miles inland, bearing N. by E.  $\frac{3}{4}$  E., and in a line with Ruapehu mountain; this leads directly for the entrance; when these mountains cannot be seen, the Seven hummocks are a good guide to the river; these are a remarkable range of hillocks to the northward of Wanganui, 8 miles from the coast, and extending in an east and west direction for three miles, the easternmost one bearing from the entrance of the river N.W. by N. 12 miles.

At 4 miles distant seaward of the river the beacons on the entrance points will be made out, and the Land-guard, a remarkable bluff head on the south side of the river, 2 miles from the south entrance point, is also a prominent object.

The north head is a castellated cliff, about 60 feet high, on which are two spar beacons. The southern point is of low sandhills, and has also two beacons on it; these beacons were originally intended as leading marks through the channels; but the bar has shifted considerably since their erection, and continues to do so after gales or heavy floods, so that they now merely serve to mark the entrance. There is 8 feet at low water

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\* Ruapehu, an extinct volcano, is 9,195 feet high. Tongariro, an active volcano, is about 7 miles to the northward of Ruapehu; from most points of view seaward they appear as one mountain. Tongariro was ascended in 1839 by Mr. Bidwill, who estimated its height to be 6,200 feet above the level of the sea.

on the bar, which has three narrow channels ; the middle and southern of these were the deepest in 1864.\*

**LIGHT.**—There is a white *fixed* light exhibited from the flagstaff on Castle cliff (North head) Wanganui, 65 feet above high water, which in clear weather should be seen 13 miles.

**Caution.**—Masters of vessels are warned that this is not a guiding light to clear any dangers, but is intended solely to enable them to keep their position off the port.

The coasting trade is carried on by vessels of about 25 tons burthen, but the river is navigable as high as the town of Petre for craft of 10 and 12 feet draught. Petre is built on the north side of the river, 4 miles from the heads.†

Wanganui river can only be entered in fine weather and with a leading wind ; when with a pilot, or local knowledge of the entrance, a vessel of the draught before mentioned may cross the bar in safety ; in fresh westerly winds it is one unbroken line of surf. There are 8 fathoms in the offing one mile from the entrance, where vessels may anchor in fine weather.‡

The coast is not dangerous, as has been generally supposed ; with the prevailing winds, (north-west and south-east,) an offing can always be gained ; with westerly or south-westerly winds, a vessel should not get embayed if there is any prospect of bad weather, but wait under Kapiti island for an opportunity of entering the river.

**Soundings.**—Between Kapiti island and Wanganui river the water shoals gradually ; there are from 40 to 50 fathoms 10 miles from the shore, until within 10 miles of the latter place, when it decreases to 30 fathoms, and shoals gradually to 9 fathoms within one mile of the beach.

**Tide.**—It is high water on full and change at Wanganui heads at 10h. 15m., the rise from 6 to 8 feet ; the flood tide runs in 5 hours, and

\* The best time to enter Wanganui river is from half flood, to high water, leaving the *red* buoy on starboard hand, and the *black* on port hand, the vessel being guided from signal staff (see page 13 for signals). From New Zealand Almanac, 1874.

† It numbered in 1871, 2,390 inhabitants, carries on a direct trade with Sydney and Melbourne and had a little steamer making fortnightly trips to Wellington and Nelson.

‡ H.M.S. *Esk*, on the 10th March 1865, rode out a heavy gale from south-east off Wanganui, in 9 fathoms water, with the following bearings: Extreme of Land-guard N.E. by E. ; Tauperi N. by E.  $\frac{3}{4}$  E. ; house on Cliff end, N. by E. ; centre of Seven Hummocks, N.N.W.  $\frac{3}{4}$  W. The coming of the gale was indicated the previous night by the clouds passing rapidly over the moon towards the south-east, and the land and distant objects standing out with remarkable clearness ; during the height of the gale the sea broke in 6 fathoms ; 24 hours from its commencement there was a dead calm, and the sea went down as rapidly as it rose.—Remarks by E. W. Creak, Master H.M.S. *Esk*.

the ebb, out for seven. On the adjacent coast the flood runs to the northward, and the ebb to the southward, from one to one and a half knots.

**FROM WANGANUI RIVER to CAPE EGDMONT.**—From Wanganui river the coast trends westerly towards cape Egmont, distant from it 75 miles, and the features of the land become entirely changed; the sandy beach and low land extending the whole distance from Waikanai now give place to perpendicular cliffs from 80 to 100 feet high, composed of blue clay, which the sea washes at high water.

The only rivers navigable for boats along this whole extent of coast are the Waitotara, Wenuakura, and Patea, the former 16 miles and the two latter (within a mile of each other) 26 miles from Wanganui river.

Waitotara point, a low sandy projection, is 14 miles westward of Wanganui, and two miles S.E. of the river of the same name. The clay cliffs commence again immediately to the westward of it, and continue to Waipipi, which is also a low sandy point, and the last on the coast.

From hence the coast recedes gradually round Waimate bight, at whose northern limit is the site of the celebrated Waimate pah;\* this bight is a slight indentation of the coast, 23 miles in extent, it affords no shelter, the coast being an unbroken line of cliffs averaging one hundred feet high; from the summit of these cliffs the level land covered with flax and brushwood extends some distance, rising very gradually as it approaches the base of mount Egmont.

Five miles westward of Waimate pah is the Kaipokonui stream, which takes its rise in mount Egmont; it is a rapid stream, bringing large boulder stones down during the summer floods, at which season it is dangerous to cross; it is not navigable even for canoes at the entrance.

About 7 miles north-west of Kaipokonui stream, is Otumutua point, 5 miles north-west of this point is Opunake bay.

**OPUNAKE BAY.**—This anchorage, only fitting for steamers and small sailing vessels, is one mile south-east of the site of Te Nama pah. Opunakē

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\* Waimate pah was formerly one of the strongholds of the natives, but, like all their other defensive positions on the coast, has been for a long time deserted, as they have retired to the more peaceful occupation of cultivating the soil a short distance inland. This pah has been the scene of many a sanguinary struggle, and is in an almost impregnable position; it is nearly insulated, being joined to the main by two narrow shingle spits; on the outer side it is a perpendicular cliff 100 feet high, and on the land side there is a natural ditch with apparently deep water in it. The summit does not occupy a space of more than a hundred square yards, and is covered with pits for the reception of provisions as well as for shelter.

This pah was attacked by H.M.S. *Alligator* in 1830, and the natives severely punished, in consequence of an affray between them and the crew of the *Harriet*, a merchant vessel wrecked near cape Egmont, and where most of the latter were murdered: a Wesleyan Mission station, under the Rev. Mr. Woon, was at that time established one mile distant from Waimate pah.

bay is of horse-shoe shape and about one third of a mile deep, with high cliffs round the shore. The north-west head extends 200 yards seaward of south-east head. The bay is sheltered from winds between south-east round by east, to north-west.

**Landing.**—The accommodation for landing and shipping at present (1872) consists of one cargo boat capable of carrying six tons in moderate weather, and is in charge of the signalman, who collects a crew of natives when required. The boat is worked in the same way as at New Plymouth, with a rope attached to the warping buoy. Small vessels can beach in fine settled weather, when the beach is remarkably smooth.

**Reefs.**—A reef extends from the north-west head half a mile in a southerly and south-westerly direction; there is also a reef off the south-east head in a south-westerly and westerly direction about one third of a mile. These reefs shelter the bay at low water in bad weather, breaking the sea before it reaches the beach.

The channel in to Opunake bay is one third of a mile wide between the before-described reefs, with a depth of water of 8, 7, 6, 5 to 4 fathoms at low water. The distance from head to head at low water is about one third of a mile.

There is a sandy beach in the centre of the bay, about 250 yards long. Detached rocks lie under water about half a cable from low-water mark, and nearly  $1\frac{1}{2}$  cables from the north-west shore. Four feet is the least depth on these rocks at low water; they are well out of the way of the anchorage.

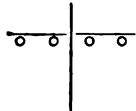
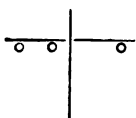
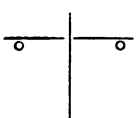
**Beacons.**—Two *black* beacons are erected on the north-west side of the bay to mark the best anchorage; the upper beacon is 20 feet and the lower 10 feet high, they are 380 feet apart, and bear from each other N.W.  $\frac{1}{4}$  W. and S.E.  $\frac{1}{4}$  E. When the beacons are in line, a vessel is sufficiently close in to have room to swing. A *red* beacon 10 feet high is placed 96 feet S.S.W.  $\frac{3}{4}$  W. from the flagstaff (situated at the head of the bay), and is intended as a leading mark into the bay. This beacon kept in line with the flagstaff leads a vessel between the reefs carrying in at low water from 8 to 4 fathoms.

**Directions.**—A vessel bound for Opunake should keep about 2 miles off shore until the flagstaff bears N.N.E.  $\frac{1}{4}$  E. then steer in on that bearing until the *red* beacon in front of the flagstaff is seen; keep this beacon and flagstaff in line, bearing N.N.E.  $\frac{1}{4}$  E. until the two *black* beacons on the port hand are in line bearing N.W.  $\frac{1}{4}$  W.; then anchor in 4 fathoms stony bottom; should the wind be strong from south-east or north-west, keep a little to windward, where will be found the smoothest water, with nearly a cable swinging room. Sailing vessels of 50 tons or upwards

should anchor about three quarters of a mile off the heads in 10 fathoms rocky bottom, on the following bearings : Otumutua point S.E. by E.  $\frac{1}{2}$  E., and the flagstaff N.N.E.  $\frac{1}{2}$  E. ; and be prepared on the first appearance of strong on-shore winds to proceed to sea.

**Tides.**—It is high water, full and change, at Oponake, at 9h. 45m. ; range of tide 7 to 10 feet.

**Signals.\***—The following signals are used at Oponake :

	Stand in with safety.
	Anchorage in the bay unsafe, but vessel can anchor outside and a boat will be sent.
	Bay dangerous, keep to sea.

**Night Signals.**—*White light over red*—Wait till daylight ; anchorage safe.

*Red light over white*—Bay dangerous ; keep off.

From Oponake the coast trends first north-westerly, then northerly and easterly to New Plymouth (*Taranaki*), its westernmost projection being cape Egmont. The configuration of the coast line here is so uniformly circular, that supposing a pair of compasses were planted on the summit of mount Egmont, with a radius of 15 miles, and a semicircle were then described, it would be an almost accurate delineation of the coast for a distance of 45 miles, or from the Kaipokonui stream to New Plymouth.

Nine miles southward of cape Egmont the cliffs terminate, and the coast from thence round to the Sugar Loaf of New Plymouth is low and rocky, with sandy or shingle beaches. Cape Egmont itself has no distinguishing feature, being a slight projection from the general curve ; it bears from the summit of the mountain W. by S. distant 15 miles.  $3\frac{1}{2}$  miles south of the cape is Harriet bay, a sandy beach two miles in extent, where the vessel before mentioned ran on shore and was lost ; her anchor may still (1866) be seen buried in the sand, flukes uppermost ; this bay is about the only spot on the coast where a vessel could be beached, as from all other parts rocky ledges extend for some distance from the shore.

**MOUNT EGDMONT**, standing alone as it does, and rising from a plain of inconsiderable elevation, is, although not the highest, certainly the most strikingly remarkable mountain in New Zealand, and may be seen from a vessel's deck in clear weather distinctly from a distance of more than

\* For general signals, see page 13.

a hundred miles. It rises in a perfect cone from a base of thirty miles in diameter, to a height of 8,270 feet above the sea, and presents nearly the same appearance, viewed from every point; its summit, which is an extinct crater, is flattened, and covered with perpetual snow for nearly a quarter of its entire elevation. A saddle-shaped eminence rises to the north-west of the mountain to a height of 4,600 feet, as a kind of off-shoot; and in the same direction, three miles from the coast, is another range of a similar character, but much lower.

**Soundings.**—The approaches to the coast between Wanganui river and New Plymouth have not yet been extensively sounded; in a line parallel with and 15 miles off shore, there are from 35 to 45 fathoms, dark sand; when mount Egmont bears N.N.E. the water deepens, and abreast cape Egmont, at the distance of nine miles, there are 57 fathoms, mud; to the northward of the cape there are 35 and 38 fathoms, sand and stones,  $2\frac{1}{2}$  miles from the shore.

**Caution.**—Vessels rounding this cape are recommended to give it a berth 5 miles, as outlying shoal spots are reported to exist.

**NEW PLYMOUTH.\***—This settlement and roadstead is nearly 20 miles north-eastward of cape Egmont; it is well marked from seaward by the Sugar Loaf islands, and by the still more remarkable dome-shaped hill Paretutu, or main Sugar Loaf, as also by its proximity to mount Egmont.

The coast for 15 miles to the eastward of this anchorage is fringed with reefs, extending three quarters of a mile from the shore; Puke-tapu reef, which is 7 miles to the eastward, extends fully one mile from the shore.

The settlement flagstaff is immediately above the landing-place, and close to the occupied portion of the town site; from it mount Egmont bears S.  $1^{\circ} 12' W.$  (*true*) 14.45 miles, and Motu-roa, the highest of the Sugar Loaf islands, N.  $77^{\circ} 43' W.$  (*true*) 2.05 miles.

The roadstead extends from the Sugar Loaf islands to a line north of the flagstaff; at an average distance of  $1\frac{1}{4}$  miles from the shore there is an uniform depth of from 10 to 12 fathoms; it is, however, not prudent for vessels of any size beyond coasting craft to come within this depth, as the bottom becomes very foul, with a reef and an irregularly attached rocky ledge extending out a long half mile from the shore, a short distance westward of the flagstaff; its eastern edge lies W.N.W., and its north extreme N.W.  $\frac{1}{2}$  N. from the flagstaff, and N.E. by E.  $\frac{3}{4}$  E. from Motu-roa. The reef and ledge break in moderate weather, and shelter the landing-place from the prevalent south-west winds and swell.

**Anchorage.**—The best anchorage is in 12 fathoms at low water, with the Wesleyan Mission school, a remarkable building standing on elevated

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\* See plan on Admiralty chart, sheet 6, Manukau harbour to cape Egmont, No. 2,535.—Scale,  $m = 0.25$ .

By an Act of the Colonial Legislature, the province alone is to be called Taranaki, the town retaining the name of New Plymouth.



ground midway between the town and Sugar Loaf islands, in a line with mount Egmont bearing S. by E.  $\frac{3}{4}$  E.; and the Seal rock midway between the two large Sugar Loaf islands, bearing S.W.  $\frac{1}{2}$  S. The flagstaff will then bear S.E. by E  $\frac{1}{2}$  E. distant  $1\frac{3}{4}$  miles.\*

The anchorage now used by trading vessels of all classes extends along a line bearing N.  $\frac{1}{2}$  W. from the flagstaff on mount Elliott (a slight elevation behind the boat sheds). Large vessels anchor from one mile to  $1\frac{1}{4}$  miles from the shore in 8 to 9 fathoms, sand and rocks, the flagstaff bearing S.  $\frac{1}{2}$  E.

The roadstead is open to all winds from south-west round by North to E.N.E. (eighteen points of the compass).

**Moorings.**—Moorings capable of holding vessels of 200 tons are laid down at about a mile from the shore, and marked by a large buoy; care must be taken not to anchor too near these moorings which lie N.E. and S.W., with 60 fathoms each way, and have a depth of 7 fathoms at low-water springs, there are other buoys farther in.

**Directions.**—A vessel from the westward bound for New Plymouth should make the outer Sugar Loaf island, and when it bears south one mile distant steer E.S.E. until the same island bears W.S.W.; keep it on that bearing until the small white flagstaff on the beach (in front of the boat sheds) comes on with the flagstaff on mount Elliot bearing S.  $\frac{1}{2}$  E., the vessel will then be close to the outer mooring buoy. A vessel from the northward, with a fair wind, may run for the flagstaff on mount Elliot when bearing S.  $\frac{1}{2}$  E. continuing on this course until the outer Sugar Loaf bears W.S.W. which will bring her near the outer mooring buoy.

**Caution.**—If working to windward from north or north-east, do not approach the coast eastward of the anchorage nearer than the depth of 7 fathoms, to avoid the reefs before described.

The general nature of the bottom appears to be rocky ledges, covered with a thin coating of dark coloured sand, but north of the settlement it is strewed with large boulders and shingle. Vessels often experience a difficulty in weighing caused by the foul ground below the sand; a stout crown rope to ensure canting the anchor should always be employed. There is

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\* Formerly a set of moorings, capable of holding a ship of the line, were laid down by the New Zealand Company to show the best anchorage. From the constant friction of a portion of the bridle chains ( $2\frac{1}{4}$ -inch iron) on the hard bottom, and possibly a chemical action from the peculiar volcanic character of the district, the links were worn to one half their original stoutness in two years, and parted while a ship of 500 tons was riding by them.

The present trade of New Plymouth scarcely warrants this outlay, neither can it support the constant expense and attention that moorings thus situated demand. It must also be observed that the settlement offers no resources for any repair of iron work, in the event of the moorings requiring it; and that for their examination, a large sailing vessel must be especially equipped for the service; this vessel while so engaged would have no harbour of refuge within 115 miles.

These moorings were far too large, and in the event of its being found expedient to lay down others, anchors of 35 cwt. with proportionate chains would suffice.

at all times a swell in the roads, and a vessel should leave with the first symptom of an on-shore wind, and therefore be prepared to slip; for this purpose it is better to use chain for the slip buoy, as the foul ground would be likely to cut rope. If obliged to slip, and the wind is N.N.W. or eastward of that point, fill on the starboard tack, but if to the westward of N.N.W. slip on the port tack, and carry as much sail as the vessel will bear.

It is necessary to ensure casting the right way.

Wind—Should the wind veer to north-west from south-west, through west, it may be looked on as certain that a strong onshore wind will set in within 24 hours, however fine the weather may be when the change takes place.

In the event of having being obliged to slip, masters of vessels can obtain information of the state of the anchorage by closing the outer Sugar Loaf, when the harbour master will inform them by signal what to do, vessels having often kept to sea in a strong south-west wind when there has been good working weather in the anchorage.

**SUGAR LOAF ISLANDS** (*Nga-motu*) are a remarkable and appropriately named group; the most lofty and striking of these Sugar Loaves (*Paretutu*) rises from a low point of the adjacent mainland as a sharp cone, to an elevation of 503 feet. The inner islet (*Motu-roa*) is similar in character and 266 feet high, whilst the outer (*Motu-mahanga*) is saddle-backed with a conical summit 190 feet high.

Anchorage will be found in south-west winds under the inner Sugar Loaf island (*Motu-roa*) on the following bearings; Pare-tuta in line with Miho Tahi, (a small rocky hill of the Sugar Loaf group which is an island

The advantages to be derived from moorings in so exposed a situation are very problematical; an organized boat establishment would prevent the necessity of large vessels risking their ground tackle by anchoring at all, and prove vastly beneficial to the general trade of the settlement, at a comparatively trifling expense.

In general, landing can only be effected in a whale boat, or surf boat for general purposes, and under the guidance of an experienced resident boatman. The government establishment consisted of a beach-master and pilot, and a coxswain to take charge of the cargo boats (capable of carrying about 3 tons each) with a whale boat for general purposes; these boats performed all the duties of the settlement, both public and private; they were manned, as occasion required, by idlers and labouring men seeking a job, natives or Europeans, as chance might offer, who were remunerated according to the number of hours employed. An experienced boat's crew could never be got together under the existing arrangements; time was lost, and the service often inefficiently performed. The boats were well adapted for the service, were carefully looked after, and had been so fortunate as to escape accident.

A warping buoy is laid down a short distance from the landing-place, and is useful for hauling the cargo boats through the surf; the buoy kept in line with the flagstaff islands is the best lead for the landing-place.

From the beach-master's report of several years' experience, he considers that a boat may be launched from the beach six days out of the seven, and the cargo boats worked five days out of seven on an average.—Extract from a Report on the Anchorage, by Mr. F. J. Evans, Master, R.N., H.M.S. *Acheron*, 1849.

at high water,) S.W. by S. ; the centre of Motu Mahanga or with north extreme of Motu-roa-West in 5 fathoms water.

There is a deep passage between these islands, avoiding Barret reef, a half-tide rock, lying half a mile westward of Motu-roa, and passing on either hand of the Seal rocks, a cluster of some extent, the highest part having 35 feet elevation.

**Winds and Weather.**—During the summer months (from November to February) there are generally regular land and sea breezes, the latter from south-west, and light winds off the land during the night.

In the winter season the weather is variable, but the spring and fall of the year bring the strongest gales. South-west or W.S.W. is the prevailing quarter ; these winds throw a heavy swell round the Sugar Loaf islands into the anchorage. South-east is the fine weather quarter, and with this wind mount Egmont is usually clear. North-west winds, which blow directly on shore, seldom blow home, and are generally preceded by a swell from that direction ; they do not come on suddenly, but back round from north-east and north.

**TIDES.**—It is high water full and change at New Plymouth at 9h. 30m., springs rise 12 feet, neaps rise 9 feet. In the offing strong currents are experienced, influenced by the winds ; after south-west gales a north-east current has been experienced, the rate of which along the land was fully one and a half knots.

**ROADSTEAD in North-west GALES.**—In the event of a vessel being compelled to leave the roadstead of New Plymouth by the approach of a north-west gale, and desiring to seek shelter, she may run for Massacre bay, the nearest anchorage ; and which affords good shelter from north-west winds.

North-west winds are generally clear, and a vessel might make the high land of Separation point without fearing Entry point and the spit off cape Farewell, by a good look-out and bearings of the land and light ; it must be remembered, however, that the inner side of this long sand spit is very steep-to. (See pages 165 and 170.)

**SIGNALS.**—In addition to the general harbour signals (page 13), the following night signals are used at New Plymouth :—

- |  |   |                       |
|--|---|-----------------------|
| From the shore. Two <i>red</i> lights vertical | - | A boat will come off. |
| From the vessel. Two white lights horizontal   |   |                       |
| with one <i>red</i> over, forming a triangle   | - | A pilot wanted.       |

The two lights on the shore will appear vertical, when a vessel is in the line of anchorage, the flagstaff bearing S.  $\frac{1}{2}$  E. the lowest light most seaward.

For additional day signals, see page 220.

## CHAPTER V.

## COOK STRAIT—(continued).

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VARIATION IN 1875.							
Cape Campbell	-	15° 20' E.		Cape Farewell	-	15° 10'	E.

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## FROM CAPE CAMPBELL TO CAPE FAREWELL, INCLUDING BLIND AND MASSACRE BAYS.\*

**CAPE CAMPBELL** is the north-east extreme of the Middle island of New Zealand, and forms the south-western entrance point to Cook strait; it bears from cape Palliser W.S.W., distant 44 miles.

The cape is a remarkable low salient point, and should be approached with caution, especially at night and in thick weather; from the northward, two steep-peaked cliffs of a yellowish colour with a rounded summit (mount Tako) aid to point out its position; mount Tako is 674 feet high, and lies  $1\frac{1}{2}$  miles to the south-west of the low extreme of the cape; an encircling dangerous reef of sunken rocks, with some detached and above water, extends nearly a mile N.N.E. of the cape extreme, which is sandy and low; this reef is also continuous  $1\frac{1}{2}$  miles to the southward on the seaward face of the cape, extending fully half a mile from the land.

**LIGHT.**—The light on cape Campbell is a *revolving* white light, attaining its greatest brilliancy *every minute*, elevated 155 feet above high water, and in clear weather should be seen from a distance of 19 miles. The tower, situated on a knoll at the extremity of the cape, is 73 feet high, and painted with alternate bands of red and white.

**Soundings.**—The depth of water in the centre of the strait between the capes Campbell and Palliser is 100 fathoms on a dark sandy bottom, the soundings decreasing gradually towards either shore. Advancing in the strait to a position midway between cape Campbell and Taourakira head, the depth increases to 250 fathoms; this appears to be a deep hole about five miles in extent, and has generally a heavy tide rippling over it; it must be observed that wherever these rippings are experienced the water is generally very deep with an irregular bottom.

**Clifford bay.**—From cape Campbell to the westward for a distance of 2 miles, the coast, which is fringed with rocks, forms a bight, and affords a

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\* See Admiralty charts, Nos. 2,054 and 2,616, being sheets Nos. 5 and 7 of New Zealand coasts; scale,  $m=0\cdot3$  inches.

fair anchorage in 7 or 8 fathoms, with southerly winds. At  $11\frac{1}{2}$  miles north-westward from cape Campbell, is White bluff, the coast of the bay between being rather low, skirted with a shingle beach; the lake Kai-parate-hau is 4 miles from the cape and just within the beach; two small rivers empty themselves into the bay to the northward of it; the northernmost, Awatere river, 3 miles south of the White bluff, is a considerable stream, having 5 feet on its bar at high water.

**White bluff** is a very remarkable range of steep white-faced cliffs, their highest summit being 890 feet high, rising boldly from the sea; a mountain range extends from these cliffs to the W.S.W., and is the southern boundary of the Wairau plains, an extensive tract of grazing country, chiefly occupied by the Nelson settlers.

**CLOUDY BAY** is the part of the coast between the White bluff and port Underwood, a distance of 12 miles; it is a deep indentation, and has a convenient depth of water for anchorage, 12 fathoms across the entrance, and 9 fathoms  $1\frac{1}{2}$  miles from the beach, decreasing gradually to the shore; there is good shelter at its head, with all off-shore winds from north round to south-east, and out of the strength of the tide, with the advantage of port Underwood being open in case of the wind drawing more to the eastward; the coast line is a deep shingle beach.

**Wairau River**, after winding through the plain of the same name, falls into Cloudy bay,  $5\frac{1}{2}$  miles from the White bluff and 8 miles from port Underwood;—as the wool trade increases this river will doubtless become of importance to the Nelson district, for in moderate weather cargoes can be conveyed by it from the plains and shipped in Cloudy bay.

The river is navigable for cargo boats six miles from its mouth; at high water there is 6 feet on the bar. A signal-staff is erected on the western entrance point, where a flag is hoisted when boats or small vessels can enter, and lowered half-mast when the bar is impassable; vessels may anchor one mile off the entrance in 5 fathoms.

**Tides**.—It is high water full and change at Wairau river at 6h. Om., and the stream runs in one hour after; ordinary springs rise 4 feet, but with south-easterly winds 5 or 6 feet; the greatest rate of tide at the entrance of the river is  $3\frac{1}{2}$  knots.

**PORT UNDERWOOD\*** is a good and spacious harbour, accessible in all weathers, and a frequent port of refuge for vessels unable to enter port Nicholson or to pass through Cook strait; it lies at the north end of Cloudy bay, and is 32 miles W. by S.  $\frac{1}{4}$  S. from the entrance of port Nicholson; the land in the immediate neighbourhood is mountainous, the thickly wooded peaks of mount Robertson rising over its western

\* See Admiralty chart, Cook strait anchorages, No. 2,685; scale,  $m = 0.9$  inches, by Captains Stokes and Drury, R.N., and officers of H.M.S. *Acheron* and *Pandora*.

side to a height of 3,283 feet, and the Treble mountain adjoining it 2,930 feet.

The harbour runs nearly north and south 4 miles, and in its upper part is divided into two arms by Separation point, a high and narrow peninsula two miles in length; the western arm is named Minna bay and the eastern arm Brenda Bay; these arms form each a separate and well-sheltered harbour, their upper portion reaching within  $1\frac{1}{2}$  miles of the western entrance of Tory channel leading to Queen Charlotte sound;—the mountains on this dividing neck are about 2,000 feet high. The entrance is well marked from seaward; off Robertson point its eastern entrance point are two rocks well out of water, with straggling ones awash near them; this point should not be approached within two cables; a distinctly shaped saddle hill rises half a mile to the eastward of Robertson point; the coast drops suddenly between this saddle hill and the higher land to the eastward.

A detached rock above water lies S.S.E. 2 cables from the north point of Robin Hood bay, the western entrance point of port Underwood; no other dangers exist but those just mentioned; the width of the entrance is one mile, the average depth within being 9 fathoms.

**Anchorage.**—Several snug bays run in from the general line of coast on either side of the port. Bells cove on the eastern shore, one mile above Robertson point, is a convenient anchorage; it is about 4 cables broad, and half a mile in depth, with 7 fathoms all over; off its northern point, connected by a ledge, is Turner island, whose outer extreme is distant from the point 3 cables, with a reef covered with kelp extending from it more than a cable. The several bays above Bells cove also afford excellent anchorage.

The first cove on the western side of the port is Ocean bay, nearly abreast Robertson point; it has  $4\frac{1}{2}$  fathoms within the points. Two miles above it, on the west side of Minna bay, and abreast Separation point, is Oyster cove, a snug anchorage with 6 fathoms; indeed, when well inside port Underwood, a vessel cannot be at fault; there is then excellent shelter, and a choice of anchorages according to circumstances.

**THE COAST.**—From Robertson point the coast trends N.E. by N. towards Tory channel and Wellington head, the latter distant from it 15 miles; the intervening shore is rugged and cliffy, and broken into small bays, with rocks extending off the points, some nearly half a mile distant, and many covered at low water.

**Caution.**—A vessel should not approach this coast nearer than one mile, at which distance from the shore 40 fathoms will be found 5 miles from port Underwood.

**WELLINGTON HEAD** is a bold and prominent headland; its sea face is a steep and rugged cliff, with a high rock standing close off it to the

southward; the summit immediately over the head rises 2,190 feet above the sea.

**TORY CHANNEL.\***—Two miles south-westward of Wellington head is the eastern entrance to Tory channel (leading to Queen Charlotte sound), its northern side being formed by Alapawa island. This channel is frequently used with advantage by small coasting vessels; the entrance is narrow, being only a quarter of a mile wide, and the strength of the tide during springs attains a rate of 5 knots; two peaked rocks extend to the south-east from the northern entrance point, and there are also some rocks above water lying a short distance off the southern point.

The channel which is 7 miles in length to its junction with Queen Charlotte sound, maintains an average width of about half a mile, the depth being from 25 to 35 fathoms, but there are several coves on either side with good anchorage in a moderate depth of water, 6 to 9 fathoms; these coves generally shoal suddenly within their points, with the bottom composed of such soft mud that a vessel might ground without feeling it, unless the lead is kept going.

The first cove is about three-quarters of a mile within the entrance on the north side, but is rather exposed for an anchorage; the next, nearly a mile above it, is Jacksons bay, divided into two portions by the White rocks, which extend off its middle point; the northern portion is Barret bay, at the head of which was a whaling establishment. There is good anchorage in Jacksons bay in 7 fathoms, but not inside the outer extreme of the White rocks.

Oyster harbour on the south side,  $3\frac{1}{2}$  miles from the eastern entrance, is the best anchorage in the channel; vessels may anchor in 6 fathoms well within it, perfectly sheltered and out of the tide; three bays succeed Oyster harbour to the westward, Arrowsmith, Dacre, and Pelham bays; on the north side of the channel Henderson bay is immediately opposite Arrowsmith bay.

The western entrance of Tory channel turns in a north and south direction; it is more than half a mile wide, with 30 fathoms water, and entirely free from dangers. Dieffenbach point, the western point, is a flat cliff extreme, rising gradually to a bare yellow summit, 1,200 feet high, some sunken rocks lie half a cable off it, so that it should not be approached within a cable. Heaphy point is the eastern point.

Vessels of any size may run through the Tory channel with a fair wind, by taking advantage of the proper time of tide; but it is not recommended for a large vessel to work through, the channel being so liable to squalls and baffling winds off the high land. The tides, moreover, are strong, and the water is inconveniently deep to drop an anchor, if it should be necessary.

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\* See Admiralty chart, Cook strait anchorages, No. 2,685., scale,  $m = 0.9$ .

**Directions.**—Vessels crossing Cook strait from port Nicholson, should steer for the second peaked hill southward of Wellington head; on a nearer approach the land southward of the entrance of Tory channel will be easily distinguished by its chalky cliff-like appearance gradually sloping down to the west head, which is steep and terminates in a small rocky islet 50 feet high; the land on the north side is higher and less steep.

**CAPE KOAMOROO**, the southern entrance point of Queen Charlotte sound, bears N.  $\frac{3}{4}$  W.  $6\frac{1}{2}$  miles from Wellington head; it is the north extreme of Alapawa island, which separates that sound from Tory channel; between these two headlands the coast is nearly straight, very steep, and iron bound; about midway it is nearly divided by the waters of East bay, which indent the western side of the island, and in some places is a mere knife-edged ridge of barely sufficient width to walk on.

**Dangers of Coast.**—Off this part of the coast lie the principal dangers in Cook strait, namely, two rocks awash north-eastward of Wellington head; the Brothers islands, with their reefs; and Cook rock.

**Awash rocks.**—The first of these dangers, the two rocks awash, occupy a space of one-third of a mile, in a north and south direction; the southern rock is nearly awash at high water and the northern rock dries 6 feet at low water; they lie N.E. by N. from Wellington head, distant  $3\frac{1}{2}$  miles, and are  $2\frac{1}{2}$  miles from the nearest part of the coast, with 48 fathoms in mid channel between.

**Brothers Islands** are two small islands, about the same size, each nearly one third of a mile in length, and about 235 feet high; they lie nearly one mile apart in a N. by E. and S. by W. direction, and bear from Wellington head N. by E.  $\frac{1}{4}$  E., the southern is distant from the head 5 miles; the northern islet bears East  $2\frac{1}{2}$  miles from cape Koamoroo.

There is no passage between these islands; several rocks and reefs are scattered about them, and the tides are very strong with heavy rippings; a rock with about 3 feet on it at low water lies W. by S.  $\frac{1}{4}$  S. from the centre of the South island a long half a mile distant, which narrows the passage between the Brothers and the land of cape Koamoroo to little more than one mile; although there is deep water (56 fathoms), this passage is not recommended, and certainly vessels should never take it without a fair wind; the Brothers islands should not be approached within one mile by a stranger.

The northern Brother is recommended as an excellent site for a light-house, which would be of valuable assistance to the navigator in passing through Cook strait.\*

**COOK ROCK** is highly dangerous, as it is only awash at low water springs, and is in the track of vessels passing through Cook strait from

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\* Commander Drury is of opinion that Stephens island and cape Terawiti would be good sites for lighting Cook strait.



the westward, and also of those entering Queen Charlotte sound. It lies N. by E.  $\frac{1}{2}$  E. from cape Koamoroo, distant  $3\frac{1}{2}$  miles; and from cape Jackson, the northern entrance point of the sound, E. by S.  $\frac{1}{2}$  S., distant  $5\frac{2}{3}$  miles; there is generally a tide rippling on and about Cook rock, and in strong winds it will be seen to break before low water—when visible it resembles a whale's back.

**Clearing marks.**—To clear Cook rock vessels entering Cook strait from the westward and bound through, or to port Nicholson, should, when abreast of Stephens island, at a distance of 3 or 4 miles from it, steer S.E. by E. for 30 miles, or until the Brothers island are in a line with Wellington head bearing S. by W.  $\frac{1}{2}$  W.; the extreme of cape Terawiti will then bear S.S.E., and Cook rock will be in a line with the White rocks and the north end of Long island, (in the entrance of Queen Charlotte sound,) bearing S.W.  $\frac{1}{2}$  S. distant  $5\frac{1}{2}$  miles; a course may then be steered S. by E. to clear cape Terawiti.

Vessels from any of the anchorages between D'Urville island and Queen Charlotte sound, after passing cape Jackson, should not bring that cape to bear to the northward of West, or should not steer to the southward of the north end of Mana island, until cape Terawiti bears S.E. by S. These directions will lead  $2\frac{1}{2}$  miles outside Cook rock. The west end of the White rocks (Queen Charlotte sound) in a line with the north end of Long island bearing S.W.  $\frac{1}{2}$  S., leads directly on Cook rock.

**QUEEN CHARLOTTE SOUND.\***—The entrance to this sound lies between capes Koamoroo and Jackson, distant from each other little more than six miles in a north-west and south-east direction.

**Cape Koamoroo** is the southern head; it has a cone-shaped hummock on its extreme, and immediately inside it a higher hill 936 feet above the sea; it will also be known by its proximity to the Brothers islands.

**Cape Jackson**, the northern entrance point, is a long narrow elbow-shaped point, the extreme of a peninsula which separates the sound from port Gore, to the westward; it is remarkable from its shape, flat towards the extreme, where it is 280 feet high, and rising at the elbow to 740 feet. Two flat black rocks lie off its outer extreme, the outer of the two one mile N.E. by N. from it, and three feet above high water; there are always tide rippings off these rocks, and the tides set across the entrance of the sound with considerable strength on both points.

**Directions.**—Vessels entering Queen Charlotte sound from the eastward may take the passage between cape Koamoroo and Cook rock, or to the northward of the latter between it and cape Jackson, as convenient; in the former case there is a clear width of more than three miles, and vessels

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\* See Admiralty Chart, Cook strait anchorages, No. 2,685, scale  $m = 0.9$ .

from the southward would generally take that channel. Passing outside the Brothers island at not less than one mile, cape Koamoroo, which has no dangers off it but what are visible, may be rounded at a convenient distance, and the White rocks and Long island passed on either side according to circumstances.

Entering the Sound from the northward or westward, there is a clear channel of five miles between Cook rock and cape Jackson, and the only directions which seem necessary are, not to stand so far to the eastward as to bring the White rocks on with the north end of Long island; while these rocks are kept open to the eastward of the island, a vessel will be to the westward of Cook rock. When Alligator head and cape Lambert are open to the northward of cape Jackson, a vessel will be two miles to the northward of the rock.

The White rocks, Motuara and Long island, lie in the entrance of the sound; the former are a ridge of peaked rocks a quarter of a mile in extent high out of the water, and bearing W.N.W., one mile from cape Koamoroo with a passage on either side of them; the two islands lie three miles within the line of the entrance capes; Motuara on the western, and Long island on the eastern side; there are also passages between and on either side of them.

The sound runs in a S.S.W. direction 14 miles, as far as the western entrance of the Tory channel, and then S.W. by W. for 11 miles to its head; its only drawback as an anchorage is the inconvenient depth of the water, which generally varies from 20 to 25 fathoms. It is indented on either side with numerous bays, particularly on the north side, where there are no less than ten in number above Ship cove; these bays all afford secure anchorage, but the least depth of water to be found in them is 16 fathoms unless at the head of the sound.

This great inlet is singularly free from dangers, for, with the exception of a shoal patch north of Motuara (the Luke rock), a sunken rock off the eastern point of Fly bay, one off Separation inlet, and another with 10 feet water, half a mile south-west of Pig island, there are no impediments to navigation. The land is high and generally thickly wooded to the water's edge, rising on the north side to an elevation of from 1,500 to 2,000 feet: on the south side are mounts Robertson and Treble 3,000 feet above the sea, which also rise over the western shores of port Underwood.

**SHIP COVE.**—At the entrance of Queen Charlotte sound on the western side, within Motuara island, are three coves, the southern of which is the Ship cove of Cook; this anchorage has the advantage of a more convenient depth of water than is to be found in any other part of the sound, though it is less sheltered than the bays further within, and is more subject to heavy squalls and variable flaws of wind during bad weather, from the high land which rises immediately over it, vessels are in consequence liable

to foul their anchors and drag, unless moored ;—the shores of the cove are rocky, and so steep that a vessel would almost bring up against the cliffs before she grounded.

**Anchorage.**—The anchorage bears west from the south end of Motuara island with a general depth of 10 fathoms in the cove ; towards the island it is not so deep, being from 7 to 8 fathoms.

A shoal rocky patch of 12 feet extends north from the north end of Motuara, and has a rock at its extreme with 6 feet water ; the latter is distant nearly three-quarters of a mile from Motuara, and is marked by kelp. Vessels, therefore, entering Ship cove from the northward, and passing between the north end of Motuara and the western shore, should keep the latter on board ; the width of this channel is less than half a mile.

The passage between Motuara and Long islands is three-quarters of a mile wide in its narrowest point, and the least depth of water 7 fathoms. Long island lies in the direction of the sound, and is  $2\frac{1}{2}$  miles in length by nearly half a mile in breadth ; its western side is steep and cliffy, and detached rocks lie off its north end, as also a rock which shows at low water, two cables N.W. by N. from the latter.\* The passage between Long island and the eastern shore is nearly three-quarters of a mile in width, with 20 fathoms water.

**The Twins rocks**, high out of water, are three-quarters of a mile east of the north extreme of Long island, and Coopers island is a quarter of a mile to the south of the Twins.

**East bay**, on the western side of Alapawa or Carlyle island, is an extensive inlet 4 miles in depth and  $1\frac{1}{2}$  miles in width, being only separated from the sea by a steep and narrow ridge, before alluded to ; the entrance of this bay is one mile south-eastward of the south point of Long island, and 5 miles south-westward of cape Koamoroo ; there are 25 fathoms water all over it ; off its southern entrance is a cliffy island nearly one mile in extent called Pickersgill island.

**Pig island** 2 miles south of Long island, is more than 2 miles long in a north and south direction, and nearly the same east and west ; it is 1,023 feet high, and has two bays on its western side ; there is a narrow channel between it and the south shore, with 24 fathoms water, but that to the westward is the fair channel up the sound.

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\* H.M.S. *Challenger* in July, 1874, anchored in Queen Charlotte sound, between Long island and Mortuara island, in 7 fathoms, with Twin rocks in line with northernmost Long island E.  $\frac{1}{2}$  S. half a mile distant ; this was found to be an excellent anchorage with south-east gales, the wind being far more moderate, and the ship lying easier at her anchor than at port Hardy during the same sort of weather.—Remarks by Navigating Lieutenant T. H. Tizard, R.N.

**Hawes Rock and Buoy.**—This is a rock with 10 feet water over it, lying about half a mile off the south-west end of Pig island marked by a *red* buoy.

**WESTERN SHORES OF SOUND.**—Returning to the western entrance of Queen Charlotte sound; the hill immediately over the south side of Ship cove has a bare yellow looking summit 1,353 feet high, and south of it Resolution bay runs in for a mile, being about the same width at its entrance, and with 27 fathoms water in it. The adjoining bay, one mile to the southward, and the most considerable in extent on the north side of the sound, is Endeavour inlet; it runs to the northward for 4 miles, with two arms, the easternmost reaching within a short distance of Cockle bay in port Gore, and making a peninsula of the land which forms the western entrance of the sound; the depth of water in Endeavour inlet is 25 fathoms.

Many Coves bay is the next, a spacious and desirable anchorage; above it is Fly bay, off the eastern entrance point of which, S.W.  $\frac{3}{4}$  S., nearly one-third of a mile, is Luke rock, with 3 feet on it at low water, which is marked by a *black* buoy.

The average width of the main arm of the sound above Fly bay is nearly one mile, and the bays and coves are so similar in features that it will be unnecessary to offer any particular description. The westernmost bay on the north side, Separation inlet, runs nearly two miles to the northward with a double head, and is only separated from an arm of Pelorus sound by a neck of land less than a mile across; the depth of water in this bay is from 9 to 13 fathoms; a sunken rock lies a cable S.E. by S. from the western cliffy entrance point.

The head of Queen Charlotte sound extends three miles above Separation inlet, and maintains an average width of little more than half a mile, with from 14 to 15 fathoms, terminating in a curvilinear sandy and shingle head, which dries for a quarter of a mile off shore, and is shoal for nearly double that distance.

**Waitohi Bay.**—The westernmost bay on the south side is Waitohi bay; it is a double bay with a small islet lying off the middle head; there is anchorage in 6 and 9 fathoms at the head of the eastern arm; the town of Picton now stands on the spot that was occupied by the native village of Waitohi.\*

The east point of Waitohi bay is a remarkable sharp point called the Snout, with four round hills very similar in appearance rising over it. In the centre of the main arm of the sound, one mile from the Snout, is the

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\* The land here was purchased from the natives, and the site of a township marked out, as it was in contemplation to cut a road to the Wairau plains, 12 miles distant; an indifferent path in 1864 connected the two, but the project of the road for the conveyance of the produce of the plain for shipment to Queen Charlotte sound, was abandoned. There is a *red* light exhibited on the end of new wharf at Picton.

small round island Negara, 300 feet high, with an islet close off its eastern side.

There are two bays and a deep narrow creek between Waitohi and point Dieffenbach, the western entrance point of the Tory channel, a distance of six miles.

**Tides.**—It is high water full and change at the entrance of Queen Charlotte sound at 8h. 50m. The general rise of the tide is from 6 to 8 feet at springs : the ebb or southerly stream commences at 9h. 40m., and the flood or northerly at 3h. 40m. The flood tide entering the sound by Tory channel, flows outwards towards Long island, until it meets the regular stream of flood ; the strength between Motuara and Long island is from  $\frac{1}{2}$  to  $1\frac{1}{2}$  knots. In the sound above the western entrance of Tory channel there is not much tide ; at the head it is high water at 10h. 25m.

**Caution.**—During strong winds in Cook strait, Queen Charlotte sound is liable to heavy gusts off the high land and out of the mountain gulleys, which give little or no warning, and it is necessary to use caution, especially with boats under sail.

**Water.**—There is no difficulty in obtaining fresh water, as streams exist in every creek, and wood may be had in abundance in every part of the sound.

**Note.**—The name of Admiralty bay has been indiscriminately assigned in the old charts to the numerous harbours and anchorages between Queen Charlotte sound and cape Stephens, D'Urville island. To prevent confusion, that name will be more definitely confined to the space between D'Urville island and the peninsula which forms the western entrance of Pelorus sound.

**PORT GORE\*** is an extensive inlet immediately westward of Queen Charlotte sound ; it lies between capes Jackson and Lambert, which are  $3\frac{1}{2}$  miles apart, bearing nearly east and west, and extends in a south-westerly direction 6 miles, meeting within one mile of Endeavour inlet, Queen Charlotte sound.

The general depth of the water in port Gore is rather inconvenient for anchorage, being from 16 to 20 fathoms. Two miles within the entrance a bank extends across with from 9 to 12 fathoms on it ; and on the eastern side  $3\frac{1}{2}$  miles above cape Jackson there is an anchorage in 11 fathoms half a mile off shore. There are two coves at the head of the port, Cockle bay, in the south-east corner, and Melville cove in the western ; the anchoring depth of water in these coves is 15 fathoms ; they both afford good shelter and holding ground. Melville cove is the preferable, and has anchorage in 12 fathoms, two cables from its head.

The land is high over the head of port Gore, and thickly wooded ; in

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\* See Admiralty chart, Cook strait anchorages, No. 2,685, scale,  $m = 0.9$ .

the centre of the peninsula, less than one mile from the head of Cackle bay, mount Furneaux rises to a height of 2,600 feet, and mount Stokes the highest in the neighbourhood,  $3\frac{1}{2}$  miles south-westward of the head of the port, attains an elevation of 3,900 feet.

**Waitui Bay**, the next bay westward, lies between cape Lambert and Alligator head; it is three miles wide at the entrance, and about two in depth; the shores around are steep and cliffy, and it is not a place of shelter.

**Guards Bay** lies to the westward of Waitui bay, between Alligator head and Forsyth island; and with its inlets Titirangi and Akaloa affords shelter from all winds; the small island (Motu) Ngara lies in the entrance  $1\frac{1}{3}$  miles N.N.W. of Alligator head, and has a reef awash at half ebb extending one-third of a mile eastward of its eastern end; there is a deep water channel between this reef and Alligator head, as also a broad and clear channel between Motu Ngara and Forsyth island.

**Forsyth Island**, which forms the western side of Guards bay, is 3 miles long, in a north and south direction, and it separated from the mainland by a very narrow channel with 7 fathoms water in it.

The entrance of Guards bay  $3\frac{1}{2}$  miles wide, with 20 fathoms between the heads, but immediately within a bank stretches across, with 8 and 9 fathoms water on it; 2 miles above the heads the bay is divided into two arms by a projecting cliffy point; the eastern arm, Titirangi bay, runs to the south-east nearly two miles, and the western, Akaloa bay, extends in the same direction for 3 miles; both have an average width of one mile, with good anchorage in from 10 to 14 fathoms muddy bottom.

There is also anchorage on the western side of the bank just noticed under Forsyth island in 8 and 9 fathoms, and with south-east winds on the southern edge of it, off the eastern point of Titirangi bay in 9 fathoms. Stokes mountain is little more than two miles distant from the head of Akaloa bay.

**PELOROUS SOUND.**\*—This great inlet, which lies between Guards bay and Admiralty bay, is similar in character to Queen Charlotte sound; it extends in a southerly direction about 25 miles, branching off to the eastward and westward into numerous arms and creeks, and embracing no less an extent of coast line than 250 miles. Its entrance on either side is formed by a peninsula, the western being almost isolated by the head of Croisilles harbour, the isthmus which divides their waters being only half a mile across; and the eastern by a narrow neck of a hundred feet broad, which separates it from the bight westward of Forsyth island, while an arm at the south-eastern head meets within less than one mile of Separation inlet at the head of Queen Charlotte sound.

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\* See Admiralty chart, Cook strait anchorages, No. 2,685; scale,  $m = 0.9$ .

**General Character of the Country.**—Except at the head of the main branch, the general character of the country is mountainous, rising with almost perpendicular acclivity to heights of from 2,000 to 3,000 feet, and clothed with dense forests. The shores of the intervening bays receiving the mountain streams, are equally impenetrable, as the sides of the ravines are steep and rugged; and with the exception of the site of an old settlement (Kopai) in one of the arms, there are few acres in any one spot that could be brought under cultivation. In proof of this the natives seem never to have had any settlement but the one mentioned, and it is deserted they say, because the ground is cursed. The soil, however, everywhere accords with the luxuriant mountain vegetation, being generally of the richest loam, and of considerable depth; the geological feature of all the points and banks of the river is soft clay slate, with frequent veins of quartz an inch thick; the whole country abounds in it, blocks being found on the hills, and the beach is strewn with quartz pebbles.

**ENTRANCE.**—The north-west end of Forsyth island forms the eastern outer entrance point, and Harding point the western, being little more than 2 miles apart. Chetwode islands lie immediately off the mouth of the sound, distant nearly two miles from either entrance point; they are two narrow islands, 3 miles long, lying in a north-east and south-west direction, connected by a reef, and have rather remarkable hills, with sharp peaked summits 800 feet high; a reef of rocks above water extends half a mile N.E. of the easternmost island, and the Sentinel rock, 65 feet above the sea, lies E.N.E.  $1\frac{1}{2}$  miles from the north-east end of the same island; there are also heavy tide rippings about these islands.

Vessels may enter Pelorous sound on either side of Chetwode islands.

**Rock.**—A rock high out of water lies in the eastern passage, a long half mile from the south-east side of the larger or south-west island.\* There is also a sunken rock, about three quarters of a mile from the south end of the Chetwode islands, and the same distance S.W. from the rock out of water; this rock has 5 feet water on it at low water springs, and may be easily avoided by keeping closer to Forsyth island, in passing through this, the western, passage.†

**Oke rock** which covers at half tide lies in the Kaka-ho channel, the passage between the Chetwode islands and Entry point, not more than 3 cables from the western shore, with 25 fathoms round it.

**Beacon.**—A small iron beacon, painted *red*, has been placed on Oke rock, that shows  $8\frac{1}{2}$  feet out of water at high water springs: the beacon is a single iron bar stayed with chains, and surmounted by a square cage, 2 feet long and 18 inches wide. Should the beacon not be seen this rock may be avoided on entering Pelorous sound, through the Kaka-ho channel,

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\* See Admiralty charts, Cook strait to cape Egmont, Nos. 2,054, scale,  $m=0\cdot2$ ; and Cook strait anchorages, 2,685, scale,  $m=0\cdot9$ .

by keeping the reef, extending from the north-west end of Forsyth island, on the starboard bow until West entry point is open, which clears it.

**Soundings.**—The depth of water in Pelorous sound varies from 45 to 16 fathoms, gradually decreasing in the main branch towards its head, where it receives two rivers forming shoal banks at the head of that arm. With this latter exception, the rock just noticed, and Kainoki, a sunken rock off the entrance of Waihinau bay, the second bay on the western side, there is no obstruction to navigation; and the sound has this peculiarity, that the nearer the points are approached, the deeper is the water.

**BAYS AND ANCHORAGES.**—The following is the order in which the bays and anchorages in this sound will be found:—beginning at the East entry point, the first bay is Ketu, one mile within, with 30 fathoms across its entrance; at the head of this bay is Snug cove, having 10 fathoms. Richmond bay (*Kopaua*) is immediately beyond, forming a bight of  $1\frac{1}{2}$  miles depth: here again the anchorage is at the head in 14 fathoms, the neighbouring mountains rising 1,800 feet. There is another sheltered bay before reaching Takaka point, which is immediately opposite Orieri island, the channel between being one mile in breadth, and 40 fathoms deep; here the main branch of Pelorous sound bends to the eastward, while another considerable arm, Ta-whiti-nui reach, stretches 9 miles to the south-west, containing three islands, and one of its bays meeting within a short distance of Croisilles harbour.

Having rounded Takaka point, the course leading up the main branch to the Hoiere river changes from S.S.W. to E.S.E. for 2 miles, when a bare point (Tewero) is rounded, and the course again is S.S. Westerly for 7 miles, then South for 7 miles more, to the upper anchorage; when the channel winds through banks in a westerly direction 4 miles, to the mouths of the Hoiere and Kaituna rivers.

Opposite Tewero point, and 2 miles east of Takaka point, is Kauauroa bay, a good anchorage, 2 miles eastward of which is Whakamawahi, an extensive arm of the sound having three branches: the Hikuraki, which is separated from the head of an outer bight by a narrow neck only 100 feet across, and also about the same height; the middle, Mamiaro, having land remarkably bare for Pelorous sound; and the third, Karepo, which runs south 5 miles; on the eastern shore of the latter is the deserted village, Kopai (before mentioned); it has excellent anchorage, and is the only part of these sounds having a tract of land adapted to cultivation; it consists of from 200 to 300 acres.

S.S.W. from Tewero point, the next reach for 7 miles is Popoure, having bays on either side: Pokohino bay on the east; the Tamuakaiwawi, Piaukahe, and Opouri bays on the west: the western bays have the best anchorage; the channel of this reach has 27 fathoms mud.



The next reach, Pinohia, or Hikapu, running southerly for the same distance, is less indented; the head of this reach was the anchorage of H.M. ships *Fantome* and *Pandora* in 1854; these vessels, the merchant ship *Tory*, and H.M.S. *Pelorus*, in 1830, are the only vessels of any size which had up to 1864 navigated the sound. At this anchorage ready communication can be had with the natives; their cultivations and small fishing stations are to be seen on the banks; the villages are 5 miles distant.

Eastward of Pinohia is the long arm of Toreamounu, or Kipururu sound, extending 12 miles E. by N., having a depth of not more than 14 fathoms, gradually decreasing towards the head, and with an average width of three-quarters of a mile.

Mahau sound, southward of the last, is 3 miles in length, divided from it by a narrow ridge, Putahinu; at its head there is a level plain, one mile long, and  $1\frac{1}{2}$  miles in breadth, extending to Toreamounu arm; Ohingoroa bay and Moi Tapu bays on the south side of Mahau sound, have cultivated land one mile S.S.W. of the anchorage.

Mahakipawa arm, 3 miles above Mahau sound, is very shoal; its head is within an hour's walk of a part of Queen Charlotte sound. Mahakipawa is rather a large native settlement; here provisions may be obtained; two small vessels traded between it and Nelson in 1864; wheat and potatoes were the principal produce; near its eastern head the rivers Hoiere and Kaituna meet, forming banks, and leaving channels only navigable for small boats.

**Tawhitinui Reach.**—Returning now to the entrance of the sound, we left the Tawhitinui reach, extending on the western side abreast Orieri island for 9 miles to the south-west; this arm differs from all other parts of the sound by having in it Orieri island, as also the three smaller islets, Tawhitinui, Awaiti, and Oaie; the latter situated in that part of the reach where Croisilles harbour is separated by an easy half hour's walk over a hill of 600 feet elevation.

Kawai sound forms the southern head of Tawhitinui reach; the four bays at its head are all of the same character, backed by mountains from 2,000 to 3,000 feet high.

The channel westward of Orieri island is called the Apua, and is half a mile wide, with 27 fathoms in it; there is a double bay to the westward, which cannot be more than three miles from the French pass, but the dividing range is very high and precipitous.

Proceeding from Orieri island outwards along the west coast of the sound, we come to Waitata bay, perfectly clear, with 14 fathoms, throughout; the entrance points are, Kaiaua, a yellow point, and Moitera, having a white rock off it resembling a boat under sail.

**Reck.**—Waihinau, the next bay, is considered a good anchorage by the natives, the squalls of wind not being so heavy as those on either side; a dangerous rock (*Kainohi*) is at the mouth of this bay, and is awash at low water; from it Danger point (the north point of the bay) bears N.N.W. half a mile, and West entry point N.E. by E.  $1\frac{1}{4}$  miles.

**PORT LIGAR,\*** immediately within West entry point, is a fine harbour, and equal to any in Cook strait; the outer portion (*Kopi*) has from 14 to 17 fathoms water; the northern shores are separated by a narrow neck, a quarter of a mile wide, from Admiralty bay. The north entrance point of port Ligar is a long yellow clay point tapering to the water.

From West entry point the land trends northerly  $2\frac{1}{2}$  miles to Harding point, opposite to Chetwode islands, and from thence westerly to Admiralty bay.

In Pelorus sound there are at least thirty bays or anchorages, mostly landlocked, and safe in any winds; the gusts in bad weather are very furious.

**Water and Fish.**—Fresh water may always be obtained; fish in abundance may be caught off the points.

**Tides, Winds, &c.**—It is high water, full and change, at the entrance of Pelorus sound at 9h. 35m.; rise, springs 11 feet, neaps 7 feet; the tides in the stream run from 2 to 3 knots, but they are scarcely felt at the anchorage; the prevailing winds blow down the reaches from seaward, but south-east winds, lasting forty-eight hours, accompanied by heavy rains and violent gusts, are not uncommon.†

**ADMIRALTY BAY** lies between D'Urville island and the peninsula which forms the western entrance of Pelorus sound. It runs in a south-westerly direction, is 7 miles in depth and 4 in width at the entrance; off the entrance are the Trio islands, and 4 miles to the north-east of the latter are the Jag rocks.

**Trio Islands** are three in number; the centre and largest is of a triangular shape, and about one-third of a mile in length; the other two are small, and lie half a mile to the northward and southward of the central islet, and connected with it by shoal water.

\* Named after the Surveyor-General of New Zealand (1854).

† Until the survey by H.M.S. *Pandora*, in 1854, it was considered that Pelorus sound would offer facilities for shipment of produce of the Wairau plains, but after an examination of the Kaituna pass (the projected route) by the officers of that ship, many difficulties were found to exist in making a suitable road to the plains; moreover, the banks at the head of the sound would prevent a vessel of burthen approaching the Kaituna pass nearer than six miles, and during the ordinary winds it would take a sailing vessel three days to work out, with the inconvenience of having to anchor in deep water every tide; under these circumstances, Commander Drury was of opinion, that Pelorus sound is not to be preferred to port Underwood or Cloudy bay.

**Jag Rocks** are a cluster, covering nearly the space of half a mile in a north and south direction, and are 40 feet high. They lie three miles to the eastward of Rangi-toto islands, and bear S.E.  $\frac{1}{2}$  S., nearly 7 miles from the centre of Stephens island.

**D'URVILLE ISLAND** is a prominent feature in Cook strait, projecting as a bold and salient point into it from the eastern shores of Blind bay. It is 17 miles in length north and south, and 5 to 6 east and west, and is separated from the main land by a very narrow channel (the French pass). The island is mountainous and wooded, the highest part attaining an elevation of 2,180 feet: entering Cook strait from the westward, D'Urville island is generally the first land made, and in clear weather its mountains are easily distinguished at the distance of 40 miles.

**STEPHENS ISLAND**, which lies 2 miles north-eastward of the northern extreme of D'Urville island, is a scarcely less prominent object, though only a mile in extent; it rises abruptly from the sea to a height of nearly 1,000 feet. There is no safe passage between these islands, though coasters acquainted with the dangers sometimes avail themselves of the channel.

The harbours of D'Urville island are, port Hardy and Greville harbour; there is also the roadstead of Rangi-toto on the eastern coast, formed by three islands of the same name which lie off it.

**Rangi-toto Roadstead** is a convenient anchorage with westerly winds ranging from north to south; it is on the eastern side of D'Urville island, four miles from cape Stephens, the northern extreme. The anchorage is in the southern bight of the bay, about one-third of a mile off shore; a remarkable double-peaked mountain, the Ears, 1,525 feet high, rising a little more than one mile to the south-westward; the water is rather deep, being from 12 to 14 fathoms close in shore.

The best approach to the anchorage is to the southward of Rangi-toto islands, a group three in number, and lying half a mile off the shore, extending  $2\frac{1}{2}$  miles in a north-east and south-west direction, and having only boat channels between.

**Tides.**—The tide sets between Rangi-toto islands and D'Urville islands at the rate of one to three knots, the flood running to the northward; ebb to the southward, but at the anchorage, which is W.S.W. one mile from the south end of the southern island, a vessel will be nearly out of its influence.

**PORT HARDY,\*** at the northern end of D'Urville island, lies between cape Stephens and Nile head, the latter forming its western entrance

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\* See Admiralty chart, Cook strait anchorages, No. 2,684; scale  $m=0.9$ .

point ; these headlands bear N.E. and S.W. from each other, distant 4 miles.

Vessels making for the port from the eastward should pass to the northward of Stephens island, as there are two clusters of rocks in the passage between it and D'Urville island, the Saddle and Tower rocks, and the tides are very strong in the passages ; several rocks high above water also extend half a mile north-west of cape Stephens.

Nelson's monument and Victory isles are in the entrance of port Hardy, the former a high rock lying one mile to the eastward of Nile head, and the latter a cluster of small islands south-eastward of and the same distance from the monument, with the Fleet (a cluster of rocks) extending again from them to the eastern shore.

The passage into the port is on either side of Nelson's monument, in deep water ; to the eastward, or between it and Victory islands, is the widest channel, as a reef extends  $1\frac{1}{2}$  cables off both Nile and Trafalgar heads,—the outer and inner western entrance points,—which narrows the channel on that side.

The tides set directly across the entrance of port Hardy, the flood setting to the westward and the ebb to the eastward ; due allowance must be made for this in entering ; in bad weather a confused sea gets up here, which renders port Hardy less desirable as a harbour of refuge for a sailing vessel during a gale, than the adjacent ports eastward and westward.

When inside Nelson's monument, the port runs to the S. by W.  $2\frac{1}{4}$  miles, with an average width of three-quarters of a mile, when one arm takes an easterly direction, and the main branch continues its southerly trend, both extending for about two miles, with anchorage in 14 fathoms ; and no less depth than this will be found in any part of the port.

**Water.**—Fresh water may be always procured from the streams in any of the coves.

**Tides.**—It is high water, full and change, at port Hardy, at 9h. 55m., springs rise 12 feet. Off Stephens island the flood or north-westerly stream begins at 5h. 15m., and the ebb or south-easterly at 11h. 15m.

**Greville or Brooke Harbour** is on the western side of D'Urville island,  $6\frac{1}{2}$  miles southward of Nile head. Mount Woore, the highest land of the island, 2,180 feet high, rises over its northern shores ; the entrance points lie north and south of each other, one mile apart, and a rock four feet out of water lies a quarter of a mile N.W. of the south entrance point (Rugged point).

The harbour runs S.S.E. for  $1\frac{1}{2}$  miles, with a width of nearly one mile, the depth from 7 to 10 fathoms ; an arm then runs to the eastward for the

same distance, with from 7 to 15 fathoms, which is nearly closed by two boulder spits projecting from either shore at the entrance; for large vessels there is no protection from north-west gales. From this harbour, the coast of D'Urville island trends S. by E. 6 miles to its south-west extreme, Sauvage point.

**CURRENT BASIN and FRENCH PASS.\***—The entrance lies between Sauvage point and Hole in the Rock point on the main land; Lebrun peninsula, a short distance within Sauvage point, with the rocks extending from it to the southward more than half a mile, leaves the width of the entrance about three-quarters of a mile, with nearly in the centre, the Piège rocks, three rocks above water, bearing from Sauvage point S.  $\frac{1}{4}$  E. three-quarters of a mile.

The Chicots, three larger rocks also above water, and covering a space of a quarter of a mile, lie W.  $\frac{1}{2}$  S.  $1\frac{1}{2}$  miles from the same point, with a reef nearly a mile to the north-eastward, between them and the shore of D'Urville island.

**Rock awash.**—Another danger discovered by H.M.S. *Pandora* also exists; it is a rock about 50 yards in extent, between the Chicots and Sauvage point, bearing from the largest of the former E. by N.  $\frac{1}{2}$  N. 7 cables, and from the latter W. by N.  $\frac{1}{2}$  N.  $5\frac{1}{2}$  cables, and is just without the line from the high water extreme of Lebrun peninsula and Sauvage point; this rock is steep-to, with a depth of 11 fathoms between it and D'Urville island, and 12 fathoms towards the Chicots; as it is only visible at low water, vessels passing between the Chicot rocks and D'Urville island must be careful to avoid it.

There is a deep water channel on either side of the Piège rocks;—Current basin then runs to the N.E. 3 miles, with a width of nearly one mile, and a general depth of from 15 to 20 fathoms, rocky and gravel bottom; it then communicates through the French pass with Admiralty bay.

**FRENCH PASS** is the narrow strait between the south end of D'Urville island and the main land, affording communication between Admiralty and Blind bays; its narrowest part, between Reef point on the north and Channel point on the south, is 540 yards across at high water; but a reef of rocks extending from the former point in a S. by E. direction about 400 yards, leaves only a clear and straight channel of 117 yards between their extreme and the low-water mark of the south shore, both being perfectly steep-to; on the extreme of the rocks, which are only uncovered at low springs, an iron perch is placed, so that vessels passing through at

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\* See Admiralty plan, Current basin, and French pass, No. 1,096; scale,  $m = 2 \cdot 8$  inches, by Commander Drury, R.N.

any time of tide can see exactly the breadth of the channel, and may pass as close as 10 yards to the iron perch if necessary.

**Rock Cod point**, two cables to the southward of Channel point, has sunken rocks extending S. by E. 100 yards from it, for which due allowance must be made, as the tides are stronger there than in the pass; there is also an awkward shell bank called the Middle bank with 8 feet at low water before reaching the pass, from the Current basin side; it is three cables long in a north-east and south-west direction, and one cable in width, and its northern extreme is only two cables from the perch on the reef.

**Buoy.**—There is a white buoy on the north-eastern edge of the Middle bank, rendering the navigation of the channel much easier. The distance from the north-eastern edge of the bank to Rock Cod point is  $1\frac{1}{2}$  cables, it follows that the seaman must judge his distance should the buoy, from any cause be removed, for the points being so much alike, and the tide so rapid, natural leading marks would be likely to lead into error.

On the eastern side of the pass there is a rocky patch  $1\frac{1}{2}$  cables N.E. from reef point, but it is not in the track of vessels passing through.

**TIDES.**—The tides, instead of setting directly through the narrow channel, set across more in a line from Rock Cod point to Channel point, and the contrary, and a tidal irregularity which though not of rare occurrence is especially remarkable in this pass, viz., that the ebb stream running to the eastward commences for two hours before actual high water by the shore, the tide at the same time rising in Current basin and the French pass; the extraordinary nature of the bottom, in connection with the narrowness of the channel, is quite sufficient to account for the whirling of the current, the depth varying from 7 to 54 fathoms, without reference to the distance from the shore or rocks.\*

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\* In offering an opinion on the French pass as an available channel for shipping, it may be observed that it is perfectly straight, and sufficiently broad and deep for the largest ships, being twice the width of the entrance to Nelson haven, and its narrowest part is passed in a few seconds. No sea can get up, and anchorage can be found on either side, but not in the pass. On the other hand, the chances of hitting the correct time of tide, the possibility of having to anchor, and of the wind failing, and the consequent risk of being carried on the rocks by the current, are disadvantages which the saving of 12 or 15 miles do not compensate for, or warrant the risk; it cannot, therefore, be recommended for large vessels; but by coasters it may be, and often is, used with advantage, anchoring in Current basin, and passing through at slack water, and by this means avoiding a heavy cross sea, which is often met with off the north end of D'Urville and Stephens islands. With regard to steamers, a vessel that could command a speed of 8 knots would generally pass through at any time of tide; and when steam navigation is introduced into Cook strait, there is little doubt that the French pass will come into general use.

As a fishing place, this pass is equal, if not superior, to any other part of New Zealand. Boats could load with hapuka, rock cod, and barracouta in an incredibly short time;

## BLIND BAY—FROM D'URVILLE ISLAND TO MOTUEKA RIVER.

**BLIND BAY** is an extensive opening, the width from D'Urville island to Separation point, its north-western extreme, being 36 miles, and its depth within these limits 25 miles.

Nelson haven lies at the head of Blind bay; on the eastern shores of the bay is Croisilles harbour; on its western are also several anchorages, namely, Tonga roads, Torrent basin, Astrolabe and Fisherman roadsteads, with the rivers Motueka, Motuere, and Waimea; the depth of water in the outer parts of the bay varies from 25 to 28 fathoms, shoaling gradually to 12, 9, and 5 within 2 miles of its head.

It is entirely free from danger, and the winds seldom blow home with violence in the upper parts; indeed, it is frequently fine and calm weather at Nelson when a strong north-west gale is blowing in Cook strait.

The land at the head of Blind bay is low, with some remarkable white cliffs, but on either side it is mountainous; the Castor peaks over Croisilles harbour, mount Duppa, and Double mount, over the eastern side of the bay, rise to heights varying from 3,000 to 4,000 feet, and mount Rintoul, a very remarkable sharp cone 4,720 feet high, lies 15 miles south of Nelson; on the western side of the bay the land rises gradually from Separation point; 8 miles to the southward of the point, two peaks rise to heights of 3,700 feet, a high and generally snow-capped range extending from them southerly nearly 20 miles, terminating in mount Arthur which is 5,800 feet above the sea level; this mountain is 25 miles W. by S. of Nelson.

**CROISILLES HARBOUR**, on the eastern side of Blind bay, is easily accessible, affords good shelter in all weathers, and is the best eastern port of refuge in Blind bay for vessels of any size caught in north-west gales. Castor peaks 3,300 feet high lie south 6 miles from cape Soucis, its south point. Three small islands lie to the westward and southward of its northern entrance point, at distances of nearly 2 miles; the westernmost is a high conical island, with rocks extending seaward from it nearly a quarter of a mile, almost awash at high water; the southernmost is Williams island.

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the crew of H.M.S. *Pandora* caught with hook and line fish sufficient, when dried, to last several weeks.—Remarks by Commander Drury, of H.M.S. *Pandora*, 1855.

The colonial authorities, however, condemn its use as an ordinary passage, and say, that, notwithstanding the French pass is constantly used by the mail and coasting steamers running between Nelson, Picton, and Wellington, they never pass through against the tide, always going round D'Urville island; and considering the eddying nature of the currents, it is dangerous to attempt to do so, as a very slight sheer would ground a vessel in a moment; at slack water with the tide there is no danger to a steam vessel handled with prudence. H.M.S. *Brisk* steamed through this pass on two occasions, once at slack water and once with the tide.—Remarks by Capt. C. W. Hope, H.M.S. *Brisk*.

Within these islands is foul ground and shoal water, and it will be advisable in entering to give them a berth of half a mile.

The width of the entrance between these isles and cape Soucis is nearly 2 miles, with a depth of 16 fathoms water; working in, after passing Williams island, vessels should not stand to the northward of a line between it and the inner north entrance point Drift round head. There is good anchorage in 7 fathoms, mud, between this island and the head, the island bearing W.  $\frac{3}{4}$  N., and the head N.E. by N. three-quarters of a mile distant.

If it is desirable to shut the entrance in, vessels may do so by proceeding from one to  $1\frac{1}{2}$  miles above the inner north point, where there is excellent anchorage, also in 7 fathoms. Hunakiwa bay, on the south side, is exposed, and not recommended for anchorage. At the head of the south-cast arm (Squally cove), a narrow isthmus, half a mile across, separates Croisilles harbour from one of the arms of Pelorus sound; the land over this neck is 560 feet high, and the natives, during their wars, have frequently hauled large canoes across to escape from their enemies.

**Water.**—Water may be obtained from a stream on the north shore one mile above the inner north entrance point.

**TIDES.**—It is high water, full and change, at Croisilles harbour at 9h. 0m.; springs rise 12, neaps 8 feet.

**Pepin Island** is nearly 10 miles S.W. of Croisilles harbour; it is close to the mainland, and appears like a point of it, being united at high water by a sandy beach. Vessels running for Nelson on this side of the bay may pass a convenient distance off the land, which appears to be bold and free from dangers. Pepin island will be easily distinguished by the land to the northward receding.

**NELSON HAVEN.\***—The entrance to Nelson haven is 10 miles S.W. of Pepin island; at the distance of 6 miles from the entrance commences the long and remarkable Boulder bank, whose southern portion forms the natural breakwater to that anchorage.

The available space for anchorage in Nelson harbour is limited for vessels of large tonnage, and the approach to it is exceedingly narrow, with strong tides.

**Pilot.**—It is absolutely necessary for a stranger to engage a pilot; an excellent one employed by Government is stationed at the entrance, and is always ready with his whale boat.

**LIGHT.**—The lighthouse is on the projecting elbow of the Boulder bank, one mile to the northward of the entrance channel. It stands on the western end of the bank, and exhibits a *fixed white* light, visible from

\* See Admiralty plan, of Nelson anchorage, No. 2,185; scale,  $m = 10\cdot0$  inches, by Captain Stokes, R.N., H.M.S. *Acheron*, 1850.



seaward through an arc of  $120^\circ$ , or when bearing from S. by W.  $\frac{3}{4}$  W. round East to E. by N. easterly. It is placed on an elevation of 60 feet above the level of high-water springs, and should be seen in clear weather a distance of 12 miles. The tower is white, and is about 10 miles south-westward of Pepin island, and half a mile N. by E. of the Powder magazine, in latitude  $41^\circ 15' 4''$  S., longitude  $173^\circ 17' 7''$  east of Greenwich.

The harbour is formed between the main land and the Boulder bank; the latter is very narrow at high water, and is in one place then covered, with a boat channel over; there are also two patches, which may be called islands, as they are always well out of water. Haul-ashore island, which is little more than a cable in extent, is at the southern extreme of the bank, and has a single bush on its outer end; the other island is a small patch half a mile to the northward of Haul-ashore island, and has a magazine built on it.

The Arrow rock, a high sharp rock, lies in the centre of the entrance a short cable South of the edge of the Boulder bank, which latter is marked by a beacon; and between the two is the entrance ledge, with only 3 feet water on it at low tides; the passage in is to the northward of this ledge, between it and the beacon, and does not exceed 50 yards in width.

**Buoys.**—Buoys mark the channel leading to the entrance, a *red* buoy surmounted with a white beacon lies at the extreme end of the Waimea sand in  $3\frac{1}{2}$  fathoms, low water, the lighthouse bearing E. by N. easterly three-quarters of a mile, and the fairway buoy S.S.E.  $\frac{1}{2}$  E., the inner buoy is two cables and the outer one six cables outside the Arrow rock;  $\frac{1}{2}$  of a cable S.S.W. from the inner buoy is the fairway buoy *red with black* beacon. The inner edge of the bar is a quarter of a mile outside the outer buoy; the bar is 3 cables across, with 9 feet on it at low water.

Vessels of large tonnage can therefore only cross the bar and enter the harbour at or towards high water, when there is at springs a depth of 21 feet.

With a strong north-west wind a vessel would scarcely run for Nelson haven, but take shelter in Croisilles harbour until it moderated; it is not often, however, that this wind blows home with any violence at the head of Blind bay.

**DIRECTIONS for ENTERING NELSON HAVEN.**—Vessels running into Blind bay for Nelson with a fair wind should get the eastern shore on board and make the Boulder bank from 2 to 3 miles northward of the haven, running along its outer edge under easy sail at the distance of a mile, carrying 6 or 7 fathoms water.

Outer Anchorage.—There is good anchorage outside the bar in all moderate weather. The mark for anchoring is the lighthouse bearing E.S.E. in 6 fathoms water, but mariners are *cautioned* not to shut the light in, or approach within the distance of one mile of the lighthouse.

The marks for crossing the bar in the deepest part, are a remarkable clump of trees, nearly two miles southward of the harbour entrance on the low land, to be kept just to the eastward of mount Rintoul; this conical mountain will be readily recognized unless the weather is thick. These leading marks are a good guide to the more definite ones of the same clump of trees in line with a remarkable ravine in the mountains, bearing S.  $\frac{1}{2}$  E.; with these marks on, and the magazine in a line with Green point (the north extreme of Signal hill), a vessel is on the outer edge of the bar, and the outer buoy will be on the starboard bow; pass half a cable to the eastward of it, and steer for the inner buoy, which is S.E. by E.  $\frac{1}{4}$  E. 4 cables distant; pass close northward of the inner buoy, when the Arrow rock will be little more than 2 cables distant; the beacon on the edge of the Boulder bank will then be seen, and also the leading marks throughout the Narrows.

The latter leading marks are two large *white* spar beacons,\* surmounted with a Ball and Triangle, at the entrance on the mainland, kept in one E.N.E.; (the Storehouse door just behind them, and the chimney of Stafford's house, also in the same line, were the marks for entering, before the beacons were erected). These marks will lead to the northward of the entrance ledge, and pass the beacon on the tail of the Boulder bank at the distance of 25 yards; when the bush on Haul-ashore island bears N.W. by W.  $\frac{1}{4}$  W., or the vessel is midway between it and the upper beacon on the starboard shore, haul up sharply N. by E.  $\frac{3}{4}$  E., or keep little more than half a cable off the wharf ends.

**Anchorage.**—Anchor just above the second wharf, with the bush on Haul-ashore island in a line with the Arrow rock; a good anchorage is in this line, and abreast Green point, in 7 fathoms mud at low water, when the body of the town of Nelson will be just open; it is necessary to moor.† The best anchorage for a large vessel is just round Haul-ashore island, with the beacons E.S.E. in 5 to 6 fathoms mud, as there it is still water, and the ship is moored head and stern, there being a mooring buoy for the stern chain.‡

Small vessels and coasters enter Nelson haven with ease on the flood tide; § and under the skilful guidance of the pilot, vessels of 1,000 tons

\* Placed in 1850 by Captain Stokes, H.M.S. *Acheron*.

† H.M.S. *Basilisk* in September 1871 parted a cable in this anchorage during calm weather, owing to the eddying nature of the tides, and also the water rushing over the Boulder bank, through the boat passage; this is caused by the water rising faster outside the bank than in the harbour.

‡ The information as to this anchorage was given by the Harbour Master at Nelson, to the Navigating Lieutenant of H.M.S. *Basilisk*, 1871.

§ A small harbour light (*red*) for the use of coasters only is established at the entrance of Nelson haven.

have been conducted to safe anchorage with scarcely less facility. To enter, a vessel must have a wind which will enable her to lay E.N.E. through the narrow channel between Arrow rock and the Boulder bank; after the tail of the latter is passed the tide will take her to a berth.

After heavy rain, freshets increase the strength of the tide considerably, thereby rendering the turn in the passage dangerous, the current strikes the vessel on the port bow and would set her on shore, if helm is not promptly given, the channel being only half a cable wide abreast of the beacons.

**Caution.**—It must be observed that the preceding directions, though accompanied by the elaborate and clear plan published by the Admiralty, ought not to justify a stranger in attempting to enter the haven without a pilot unless in great emergency.

**TIDES.**—It is high water, full and change, at Nelson at 9h. 50m.; springs rise 14 feet, neaps rise 10 feet. The streams of tide change 0h. 17m. after high and low water at springs: the flood runs for 7h. 10m., and the ebb 5h. 40m. The tides run rapidly along the eastern shore of the harbour, but by anchoring in the line directed a vessel will be out of the influence of their greatest strength.

In consequence of the great range of tide, Nelson haven is one of the few places in New Zealand where a vessel of large tonnage may beach herself for repairs. H.M.S. *Fly* (485 tons), as well as large merchant vessels, have been placed ashore for this purpose on the sandy beach on the inner side of Haul-ashore island.

**BOLTON HOLE ANCHORAGE.**—The Waimea river to the westward of Nelson haven discharges itself into Blind bay by three channels; the waters from its eastern mouth, together with those from Nelson haven, have formed a deep hole 4 cables westward of Haul-ashore island, or between the tail of the Boulder bank and the eastern end of the Waimea bank, where there is anchorage in 6 and 7 fathoms, sheltered in some measure by the bar outside it. This anchorage is known as Bolton hole, and a good berth is in the line between the buoys, with the south end of Haul-shore island in one with Stafford's house.

**ANCHORAGE IN WAIMEA RIVER.**—Vessels during north-west gales, unable to enter Nelson, sometimes take shelter in the eastern mouth of the Waimea river; on entering, the eastern edge of the Waimea bank and sand elbow, which are about half a mile westward of Haul-ashore island, must be avoided. The mark to clear the elbow is, Thompsons house (a single greystone building, close over the extreme of cliffs, and  $\frac{3}{4}$  mile southward of the Storehouse at the entrance of the harbour) not to be brought to the eastward of S. by E.  $\frac{1}{2}$  E.; run in on this bearing in 19 feet at low water, until the Arrow rock is on with the south part of Haul-ashore island, when steer S.W.  $\frac{1}{2}$  S., keeping these marks on for about a

quarter of a mile, and anchor in 26 feet mud at low water, sheltered by the bank of the river, or proceed higher up if necessary.

The central and western mouths of Waimea river are respectively  $2\frac{1}{2}$  and  $6\frac{1}{2}$  miles westward of Nelson, and are navigable for coasters. Two miles to the N.W. of the western mouth commence the White cliffs, which extend more than 3 miles along the coast; these cliffs are in some places 250 feet high, remarkable, and are seen a long distance from seaward.

The coast between Nelson Haven and the White cliffs is shoal, having  $4\frac{1}{2}$  fathoms at a distance of  $2\frac{1}{2}$  miles from it; north-eastward of their southern or highest part, more than 2 miles off shore, there is a patch of less than 3 fathoms. At the north-west end of the cliffs is the Moutere river, which has two entrances two miles apart; it is a smaller river than the Waimea. At  $3\frac{1}{2}$  miles to the northward is the Motueka river, and two small low islets, with sand flats between, extending nearly one mile off shore.

BLIND BAY—FROM SEPARATION POINT TO MOTUEKA RIVER.

On this western coast of Blind bay are several small anchorages, which will be now given in detail, commencing from the northward.

**SEPARATION POINT**, the north-western extreme of Blind bay, and which separates it from Massacre bay to the westward, is a small cliffy projection connected by a neck with high land rising immediately from it.

At the distance of  $1\frac{1}{2}$  miles S.E. of Separation point is a remarkable white stripe in the cliffs, which can be seen at a long distance, and can be advantageously used as a mark for clearing the end of cape Farewell spit.

**AWARAUA BAY**, 3 miles in extent, with sandy beaches, and having from 7 to 10 fathoms water, lies immediately southward of the white stripe, and there is anchorage off in 10 fathoms in moderate weather: from its southern point, which is rugged and cliffy, the coast, of the same character, extends  $2\frac{1}{2}$  miles in a south-easterly direction, to Reef point, the north point of Tonga roadstead.

**TONGA ROADSTEAD**.—This anchorage is 7 miles from Separation point, and is a snug haven with all westerly winds from north to south; the bay is half a mile in depth, with a smooth sandy beach at its head; the small island of Tonga, about two cables in extent, lies off the centre of it, and the anchorage is about four cables to the westward of the island in 8 fathoms; there is a passage on either side of Tonga island, that to the northward being over three cables wide, with 8 and 9 fathoms, the southern is half a mile in width, with from 6 to 10 fathoms; vessels entering to the northward of the island must avoid a reef which extends off Reef point more than a cable.

\* See plan on Admiralty chart, No. 2,616, cape Foulwind to D'Urville island.

**TORRENT BAY**,\* the next anchorage, is  $3\frac{1}{2}$  miles south-eastward of Tonga island, and 11 miles from Separation point; the intermediate coast is clifty, varied with small sandy coves; there are several rocks extending more than half a mile off shore, and a long reef awash about midway between the two anchorages, with a small islet one mile to the southward of it; this part of the coast should not be approached within one mile.

Torrent bay is more than half a mile in width between its north and south points (North point and Jetty point); the basin is in the southern bight, and affords good shelter for small vessels in 3 to  $3\frac{1}{2}$  fathoms, except in north-east winds; in the outer part of the bay there is good anchorage in 6 and 7 fathoms, with off-shore winds. Three torrents discharge themselves into the basin through deep ravines, and hence its name.

**ASTROLABE ROAD**\* is only a mile to the southward of Torrent bay, and is separated from it by a peninsula, the neck of which is half a mile across. The anchorage is between Adolphe point, its northern point, and Adele island; the latter is nearly one mile in length, and lies 4 cables from the shore.

**Hapuka reef** is a quarter of a mile eastward of Adolphe point, having a narrow channel inside it with a depth of 6 fathoms, this rock dries 2 feet at low water spring tides.

**Beacon**.—There is an iron beacon with cage (*red*), 13 feet high, on Hapuka reef.

There is also a sunken and dangerous rock, with 6 feet on it at low water, lying in the entrance, a quarter of a mile north of Jules point, the north-east extreme of Adele island. The main channel between this sunken rock and Hapuka reef is 4 cables in width, with 8 fathoms water. There is also a narrow passage between the sunken rock and Jules point, with the same depth of water.

**Clearing marks**.—When on sunken rock, the outer summit of Tonga island is seen midway between Adolphe point and Hapuka reef; it is avoided by keeping the latter reef on board within about a quarter of a mile in entering; and so long as the north end of the sandy beach northward of Guilbert point on the mainland is seen just open of the north-west clifty treme of Adele island, a vessel will be to the northward of it.

**Anchorage**.—The anchorage is half a mile within the entrance points in mid-channel, in 6 fathoms, the passage between Adele island and the mainland being open; this passage is nearly half a mile wide in its narrowest part, with 12 feet the least depth at low water, so that a small vessel can obtain shelter from all winds on the west side of Adele island. Astrolabe roadstead will be found a snug little anchorage with all westerly winds from north to south.

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\* See plan on Admiralty chart, cape Foulwind to D'Urville island, No. 2,616; scale,  $m=0\cdot25$ .

**Tides.**—It is high water, full and change, in Astrolabe road at 9h. 10m. springs rise 14, neaps 10 feet. The tides are not much felt in Blind bay, varying from a  $\frac{1}{4}$  to one knot along the shores, but with northerly winds a current generally sets to the southward at the rate of nearly one mile an hour.

**FISHERMAN ROADS** are to the southward of Adele island, between it and Fisherman island, an adjacent small rocky islet; it is three cables across the entrance, and has good anchorage in 20 feet at low water, midway between the two islands. H.M.S.V. *Acheron* found good shelter here.

**Caution.**—From hence the Motueka river is 4 miles to the S.E., with sandy bays and small coves on the coast between, where shelter may be had for boats; but large vessels running down this side of the bay should keep at least 2 miles off shore, and when approaching to abreast the White cliffs increase their distance to 3 miles.

#### FROM SEPARATION POINT TO CAPE FAREWELL.

**MASSACRE BAY**, the westernmost anchorage in Cook strait, lies between Separation point and cape Farewell, the north-west extreme of the Middle island of New Zealand; the land on both the western and southern sides is high; on the former side an extensive valley lies between two mountain ranges, through which winds the Aorère river;\* on the southern side of the bay, about 15 miles from Separation point, and westward of the range which extends from that point, commences the Aopuri range, running in the same direction about 10 miles, the mountains varying in height from 4,500 to 5,500 feet.

Cape Farewell itself terminates rather abruptly, its extreme showing from the eastward like an isolated cliff, descending in steps to the westward: the land immediately within the cape is from 400 to 600 feet high, and five to six miles southward of it, mountains varying in height from 1,000 to nearly 4,000 feet extend to the south-west until they nearly meet the Aopuri range.

The most remarkable coast mountain on the western shore of Massacre bay is mount Burnett or Knuckle hill, which has a double rounded summit; the northernmost and highest is 2,085 feet high; it is nearly 9 miles S.W. from cape Farewell, and about 2 miles from the beach; this mountain can be advantageously used as a leading mark to clear Farewell spit.

**FAREWELL SPIT** extends from cape Farewell in an easterly direction 17 miles, slightly curving to the southward towards its extreme, and is the

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\* On the banks of this river, and in their neighbourhood, extensive coal-fields of good quality were said to be discovered in 1851.

danger which ships must be careful to avoid in entering Cook strait from the westward or southward; several vessels have been wrecked on it within the last few years, but this has generally arisen from a want of due caution; it is, however, a treacherous spit, so great a part of its eastern extreme being covered at high water, and its southern or inner side being very steep-to.

The portion which is always above water extends 13 miles from cape Farewell and maintains an average width of a little more than half a mile; it is composed of low sand mounds partially covered with vegetation. There is a cluster of bare sand hillocks midway between the cape and the extreme, the highest of which is 90 feet above the sea, and at the high-water extreme, or Bush-end point, are several scattered bushes growing.

**Soundings.**—From Bush-end point, the low-water extreme of the spit which dries in patches, extends S.E. by E. 4 miles, and the water shoals suddenly at the distance of  $1\frac{1}{2}$  miles outside it, from 25 to 5 fathoms. On the northern or outer side of the spit the water shoals gradually from 40 and 35 fathoms (sand) 5 miles off shore, to 14 fathoms within one mile of it. On the southern or bay side the sand dries in patches for more than 3 miles from the high-water edge of the bank, and in some parts for even 6 miles to the southward, there are only a few feet water, shoaling suddenly to that depth from 7 and 20 fathoms.

**LIGHT.**—The lighthouse on Bush-end point is 113 feet high, painted in alternate bands of red and white. The light is a *revolving* white light, excepting in the direction of the spit end, between the bearings N.W.  $\frac{1}{4}$  N. and W. by N.  $\frac{1}{4}$  N. where it is *red*, attaining its greatest brilliancy *every minute*; it is elevated 120 feet above the level of the sea, and in clear weather should be seen a distance of 17 miles. The light is shut in by the sand hills to the southward of E. by S.

**Caution.**—Vessels should not open the northern edge of the red light when within 4 miles of the lighthouse.

**TASMAN'S CORNER**, in the north-west part of Massacre bay, is a horse-shoe shaped space of deep water, with good anchorage in 7 and 8 fathoms, well sheltered from easterly winds by the banks just mentioned extending to the southward of the spit. It is 4 miles in extent either way; and so long as Fossil cliff the eastern extreme of cape Farewell is not brought to bear to the westward of N.W. by N., a vessel will be well clear of the banks which form the eastern boundary of the anchorage.

‡ **Anchorage.**—Some patches of this bank are always dry, which will be the best guide, anchoring 2 miles to the westward, or midway between them and the shore; mount Burnett bearing S.W., and the Fossil cliff N.N.W., in 7 fathoms.

With northerly or westerly winds this is a sheltered anchorage, and

with easterly winds the water is smooth, being protected by the bank ; to south-east winds it is in a measure open but no heavy sea could get up ; and there is no reason to doubt that with good ground-tackle, a vessel would ride out any gale from that quarter. A heavy surf, with only a moderate wind, frequently sets on the beach, which is shoal for nearly one mile off, and H.M. surveying vessel *Acheron*, in 1850, lost an able surveying officer, Mr. Burnett, and part of a boat's crew, attempting in a whale boat to pass through this surf at night during a fresh breeze ; this accident occurred at Memory creek, about 6 miles southward of Fossil cliff ; this creek nearly meets one of the arms of Wanganui inlet, on the outer coast where the party had been employed surveying.

**Aorèrè River.**—The entrance of this river is  $1\frac{1}{2}$  miles to the southward of mount Burnett ; its southern head is a streaked cliff, the northern, a sandy point. The bar of the river extends more than a mile off shore, and is dry at low water, except a narrow channel with one foot water in it.

**COALING ROAD.**—From Aorèrè river the coast of Massacre bay trends south-eastward 8 miles to Coaling road, which latter is 6 miles westward of Separation point, and has good anchorage with southerly or easterly winds off the Motu Pipi river in 4 fathoms,  $1\frac{1}{2}$  miles from the shore at high water ; at low water the sands dry nearly one mile from the river's mouth, and large boats only can enter at half flood. Coasting vessels are built here.

**Coal.**—Coal was obtained with much facility from the face of some remarkable white triangular-shaped cliffs at the river's mouth ; but as far as it had been superficially worked, found to be of an inferior quality, and highly sulphureous. It was used on board H.M. surveying vessel *Acheron*, but would not keep the steam up unless mixed with more than an equal proportion of New South Wales coal.

**TATA ANCHORAGE.**—On the eastern side of Coaling road, 3 miles E.N.E. from the anchorage, and 4 miles south-westward of Separation point, is Tata point, and two small islands of the same name ; within these islands is a small anchorage where two or three small vessels may obtain good shelter from north-west winds ; a vessel of large tonnage might also get shelter by passing close round the south end of the southern island, and dropping her anchor just within.

There is a passage for small vessels between the two islands, but not between the northern island and the point of the main, as a bar of 5 feet extends from the centre part of the former directly across : just to the northward of Tata anchorage is Burial bay ; it has a sandy beach, and is shoal a short distance within the points.

**DIRECTIONS FOR ENTERING MASSACRE BAY.**—The general depth of water in Massacre bay is from 10 to 20 fathoms, and it affords



good shelter in all parts, with north-west winds; the only danger to be avoided is Farewell spit, for which is given the following directions:—

A vessel running for Massacre bay to obtain shelter should make the high land of Separation point, and by not bringing it to bear to the southward of S.S.W. will ensure her passing nearly 4 miles to the eastward of the extreme end of Farewell spit; when the remarkable White stripe can be made out ( $1\frac{1}{2}$  miles south-eastward of Separation point), and which in clear weather can be seen a long distance outside the bay, it may be brought to bear S.  $\frac{3}{4}$  W., and steering for it on that course, will lead nearly 2 miles from the Spit end, in 25 fathoms. When mount Burnett bears W. by S.  $\frac{1}{4}$  S., the southern edge of the spit is cleared, and a vessel may haul into the bay.

If bound for Tasmans corner mount Burnett should be kept on the above bearing until Fossil cliff bears N.W. by N.; the dry patches on this spit will then be seen about 3 miles to the northward, and a course may be steered for the anchorage as before directed.

**DIRECTIONS for VESSELS entering COOK STRAIT from the SOUTH-WEST.**—A vessel entering Cook strait from the south-west with a fair wind, after making the land southward of cape Farewell, should run along it at a distance of about 3 miles;\* when abreast the cape at that distance, a course should be shaped E. by N.  $\frac{1}{2}$  N. for 14 miles, when she will be 6 miles north of Bush-end point, the high-water extreme of Farewell spit, and the bushes as well as the lighthouse will be in sight; the course now should be S.E.  $\frac{1}{2}$  E. 10 miles,—when Separation point ought to bear S.S.W.—or until the White stripe is made out and brought to bear S.  $\frac{3}{4}$  W., when courses may be steered for either Massacre or Blind bays.

If bound through Cook strait or for port Nicholson, pass a convenient distance northward of Stephens island. D'Urville and Stephens islands will be seen in clear weather at the end of Farewell spit, and generally from a greater distance.

**Tides.**—It is high water full and change at Motu Pipi river, Coaling road at 9h. 50m., and at Fossil head in Tasmans corner at 8h. 45m., springs rise 14, neaps 10 feet. On the outer coast of cape Farewell it is high water at 9h. 0m., the westerly or flood stream commencing at 6h. 8m., and the easterly or ebb stream at 12h. 0m.

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\* A remarkable sand patch shows out at cape Farewell, on making the land from the westward; which most probably is the sandstone island marked on the chart.—Remarks by Navigating Lieutenant T. H. Tizard, H.M.S. *Challenger*.

## CHAPTER VI.

## FROM CAPE MARIA VAN DIEMEN TO NEW PLYMOUTH.

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 VARIATION in 1875.
 

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Cape Maria Van Diemen 13° 35' East. | Manukau harbour 14° 10' East.

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In completing the description of the west coast of the North island, it is considered desirable to commence at cape Maria Van Diemen the north-west cape, and proceed southward, in preference to following the coast northward from New Plymouth, as vessels from Auckland or the harbours on the east coast bound for the western ports would unquestionably adopt the northern route; while those from the westward, bound to Hokianga river or Kaipara harbour, frequently sight the Three Kings islands and run down the coast for those ports; this arrangement will, therefore, be obviously more convenient.\*

**CAPE MARIA VAN DIEMEN** is lower than the land east of it; it projects from a sandy isthmus, and makes like an island, and bears from the south-western extreme of the Three Kings islands E. by S.  $\frac{3}{4}$  S. distant 38 miles. A small double islet lies immediately to the north-west of the cape, but with no channel between.

**Caution.**—The tides off this cape are rapid, and races are frequent; it is therefore advisable to give the coast a berth of 3 to 4 miles; indeed the tidal influence here extends to the Three Kings; along the north coast the flood sets to the westward, and on the west coast to the southward;  $1\frac{1}{2}$  miles from the shore the tides are generally twice as strong as 3 miles off.

**PANDORA BANK**, lying 6 miles S.S.W.  $\frac{1}{2}$  W. of cape Maria Van Diemen, frequently breaks heavily, and sometimes appears like a race, but not less than 5 fathoms has been found; the shoal part covers two square miles, and is of hard sand, covered with sea-weed. Immediately seaward there is 20 fathoms, and between it and the shore is a channel with a depth of 13 fathoms.

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\* See Admiralty charts of New Zealand coasts, sheets 1, 2, and 6, Nos. 2,525, 2,543; 2,535; scale,  $m = 0.3$  inches.

**COAST TO REEF POINT.**—Six miles south-east of cape Maria Van Diemen commences the hard sandy beach, which extends in the same direction nearly 40 miles to Ahaipara; the only interruptions along its whole extent being the small rocky islet Motu Pea and the Monganui rocks; the former, 11 miles from the cape, is about half a mile from the beach, and 100 feet high; although there is an appearance of deep water within Motu Pea, the constant rollers would prevent even a coasting vessel taking the channel.

Monganui, a fishing retreat of the natives, is a rocky projection 15 or 20 feet above the level of the sea, connected with the sands at low water, and is  $6\frac{1}{2}$  miles distant from Motu Pea; a range of white sand-hills, varying from 100 to 300 feet in height, extends along this coast a short distance within the beach line; at a distance of 5 miles from the shore the soundings are from 20 to 25 fathoms, grey sand.

**AHAIPARA ROADSTEAD**, at the extreme of the sandy beach just mentioned, affords no shelter from westerly winds, but in fine weather vessels of any tonnage could ship the produce of the Victoria plains and of the fertile country at the foot of the mountain range, extending from Reef point to the eastward; in the small nook within (Ongonga) boats can ship cargo.

The approach is clear, and the anchorage is after bringing Reef point (*Tau-roa*) to bear S.W.: the soundings will be found to decrease gradually from 10 fathoms, the bottom fine sand. South-west and south-east winds are favourable for lying at this anchorage; it is also sheltered from north-east, but as the gales from this quarter veer to north-west, it would not be prudent to remain.

**REEF POINT** is a long table projection, sloping down from hills chequered with sand; a spit of sand which generally breaks, extends for half a mile to the westward; one mile west of the point 16 fathoms will be found; the tide, which runs from 2 to 3 knots, is imperceptible in Ahaipara bay;  $1\frac{1}{2}$  miles south of reef point is a remarkable sandy ravine; the sea is said to be encroaching fast on this part of the coast.

**FALSE HOKIANGA** (*Herekino*)\* is 9 miles south of Reef point, and 16 miles northward of Hokianga river; it is a small and dangerous harbour, with a swell always setting on the beach; no vessel drawing over 6 feet water should approach it, and then only in fine weather; on the north entrance are sand-hills chequered with green patches, and from the south head bare hills rise suddenly to an elevation of 800 feet, and continue the same height to Wangape, with a table summit and deep ravines showing to seaward.

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\* False Hokianga was mistaken for Hokianga river by H.M.S. *Osprey* in 1846. From this cause she was wrecked there: a few of her timbers still remained on the north entrance in 1854.

**WANGAPE** is a small port, 5 miles to the southward of False Hokianga, and is used by small vessels in fine weather; it has no bar, but there is a sunken rock in the channel, which is less than a quarter of a mile in width; the tides here are strong and set across from point to point, so that a vessel entering with a strong flood would inevitably be carried on shore; there is a depth of 5 fathoms in the channel, the northern side of which is the best; there is also a sunken rock (*Maniawa*) said to exist at the entrance.

The heads of Wangape are bold, and the land on either side is high, and continues so for 4 miles to the southward of the entrance, when the range terminates and is succeeded by a sandy beach, backed by sand-hills varying from 100 to 300 feet high, and which extends nearly 8 miles to the north head of Hokianga river.

**HOKIANGA RIVER\*** is the northernmost port on the west coast accessible to ships of burthen. It flows in a north-easterly direction for 20 miles between the wooded ranges of Waima and Punghuru, whose steep sides approach the banks at distances varying from 4 to 10 miles, supplying the main river by large tributaries winding through valleys of great capabilities. These mountain ranges are from 1,500 to 2,000 feet in height; Maungataniwa, at the head of Maungamuka river, was found to be elevated 2,150 feet, probably the highest mountain north of the Hauraki gulf. Hokianga river is navigable, and has few obstructions for a distance of 15 miles from the heads, the depth in the channel varying from 4 to 26 fathoms, mud and sand, and the water is salt to its source.

**The Bar.**—The old plans show three distinct channels over the bar, the north, middle, and south-east; a pilot, who had been here 23 years, believed in the existence of these channels, though he only used the middle one. The result, however, of the survey made in H.M.S. *Pandora* (1851) proves that the bar extends directly across from N.W. to S.E. for 2 miles, at the distance of  $1\frac{3}{4}$  miles from the heads, and must be crossed in 16 feet at low-water springs; it is composed of dark green sand, with surface inequalities, and is a quarter of a mile in width.

**Caution.**—Since the last survey, the bar has considerably shifted, and a vessel in April 1867 drawing but 10 feet water touched at a spot, where at the time of tide she was crossing she would have found 24 feet by the Admiralty chart. Vessels are therefore warned to approach the bar with extreme caution.

**DIRECTIONS FOR ENTERING.**—In approaching Hokianga river, a stranger should be confident of the latitude, for reason of the similarity which exists in some points between it and the small ports to the northward,

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\* See Admiralty plan of Hokianga river, No. 1,091; scale,  $\frac{1}{30}$  inches.

and the possibility of being thus mistaken in thick weather, as in the case of *H.M.S. Osprey*; neither should it be attempted unless with fine weather and a leading wind. There is a signalman stationed on the South head who directs vessels in by a moveable flagstaff and code of signals.—See page 13, for New Zealand general harbour signals.

The entrance may be known by the north head of the river being the southern termination of a sandy range which extends 8 miles to the northward, and is from 100 to 300 feet in height, while to the southward of it no sand-hills are to be seen for a distance of 17 miles, or until passing Monganui bluff, when the sand again commences.

**Monganui bluff** is high land (2,046 feet), falling abruptly to the water 17 miles southward of Hokianga river, and on a tolerably clear day will be seen from a vessel coming from the northward or westward long before reaching the entrance of the port. There is no high land like it on the coast, and it is a good mark to make at any time for vessels approaching Hokianga or Kaipara.

A constant swell from the westward breaks heavily on the beach, and the bar is almost always breaking; vessels should, therefore, be prepared for shipping a sea; three rollers generally are experienced before the bar is passed.

A vessel should be off the entrance, so as to carry the flood into the harbour; and about half-flood is the best time for crossing; should the first of the ebb have made, and the bar appear passable, it must still be borne in mind that there is a tide of 5 knots to contend against, with the chance of the wind falling, as also that the anchorage between the bar and the heads is bad.

**Approaching Hokianga from the north-west**, and when within 4 or 5 miles of the heads, keep to the eastward until two white beacons in Martin bay, which may be seen at a distance of 5 miles, are brought to bear E.N.E., then stand in, keeping the two beacons in line, which will lead for the deepest water on the bar, 17 feet, low water springs. Attention to the semaphore arm will lead to the deepest water, as the channel shifts occasionally.

**The South head** is 150 feet high, and has a signal-staff on it. The Pilot boards off the South head, but seldom outside the bar.

The outer edge of the bar is  $1\frac{3}{4}$  miles from the heads, and it will be found to shoal from 8 fathoms to  $3\frac{1}{2}$  at one cast. Monganui bluff is then in one with a low point bearing S.E.  $\frac{3}{4}$  E. about 6 miles distant, and the shoalest water is when the bluff is in line with a nearer point: when the three points are in one, the bar is crossed and the water deepens.

At the entrance between the heads there is a depth of from 16 to 27 fathoms, but there are two dangers on the north side of the channel, which narrow it considerably; these are the Nine-foot rocks, and a patch of two feet off the north head; by keeping the beacons in line, those dangers will be avoided.

**Caution.**—It must be remarked that the ebb sets directly on the south head spit, and in going out due allowance must be made for clearing it; several small vessels have drifted on this spit during light winds.

**Martin Bay.**—This bay is just within the south head, and has no dangers, the holding ground is good, but there is generally a considerable swell; it is therefore better in entering not to anchor until past the Middle ground. Vessels outward bound, anchor here to await an opportunity of crossing the bar.

**Middle Ground.**—A good channel exists either side of the Middle ground, but the eastern channel is the broadest.

**Waerohea River.**—There is foul ground off this river, which frequently causes a race, and the outer ledge is only dry at springs.

After passing the south head, and when it is brought to bear S.S.W., steer N.E. until Young's point bears N.  $\frac{1}{2}$  E., then steer for that point until midway between it and the low sandy point Rangī; then edge over to the westward to avoid the bank south of Young's point, but do not stand so far as to shut the north head in with Rangī point.

After passing Young point, steer for the next point on the same side (Kowwarri): abreast Mahenna island 4 fathoms will be found the least water: keep a cable from Kowwarri point, which has rocks off it covered at half tide; when abreast Kowwarri, steer over for Tekaraka point to avoid an extensive flat between the former and Onok point, but when nearing Tekaraka edge away for Direction head, not approaching within a cable of Tekaraka, as rocks dry off it to the southward at low water.

From Direction head, the river course in mid-channel is N.E. by E.; there are no dangers but the low water edges of the banks, which extend a short distance without the line of the points.

From Mutawhera point, which is steep-to, keep Hurds point (a long low point) on the starboard bow, to avoid an extensive flat formed by the Omanai river: from abreast Hurds point, steer for the north point of the Narrows.

**NARROWS.**—To pass through the Narrows, which are deep, a vessel should have a commanding breeze or slack water, as the tides, which occasionally run 4 knots, set from point to point.

The only danger in the Narrows is the Kohatutakataka rock, which is just covered at high water, and extends one-third of the way across from

the north point of the upper end of the Narrows: it is steep-to from the southward, but there is no channel between it and the north shore.

From the Narrows, give the north bank a fair berth, steering for Motuti, a low sandy islet: below this islet, and abreast Kokohu (Mr. Russel's station), is as high as vessels of burthen can proceed. The width of the deep water channel here is 2 cables, and the anchorage is in 4 to 5 fathoms.

In working down the river, as a general rule, a vessel should not stand within the line of the points, as the mud flats in all the bights, however deep, extend from point to point, and are invariably steep-to; the Narrows should be passed with a leading wind, unless a pilot understanding the set of the tides should undertake to work a smart vessel through.

**Creeks.**—There are four extensive salt-water creeks on the north bank of the river, within 7 miles of the head, meandering through miles of mangroves, and terminating near the foot of the Punghuru mountains; they are the Pupuwae, Ohihupa, Punehu, and Waiho.

**Pupuwae Creek** is all dry at low water, and one mile from the mouth expands into an extensive mangrove flat; a small fresh-water stream winds among three remarkable peaks, with kauri trees on their slopes.

Above this valley is the termination inland of the great sandy hill ranges and on their summit is a fresh-water lake, about three quarters of a mile in circumference. It appeared to be deep, was covered with wild fowls, and is about 600 feet above the level of the sea: several fish were seen jumping, apparently about a quarter of a pound in weight: the natives call them Nioioni, described as a fish of many colours.

**Ohihupa**, the next creek, is also dry at low water; at Mata point, just to the southward of the creek, was an Englishman's house (Munro); the country between these creeks to the hills is excellent soil.

**Punehu Creek** runs  $2\frac{1}{2}$  miles, navigable for boats at half tide; the south bank is inhabited by natives and well cultivated: the north shore is thickly wooded with kauri and totari; at the head is another native village.

**Waiho Creek**, 7 miles from the heads, is similar to Punehu; the mangroves, through which it winds, extend across half a mile: the south bank is partially cultivated, and at the head is an extensive valley, clear of timber and uncultivated, terminating at the foot of the Punghuru range. It is said that small schooners have been some distance up, if so, they must ground on the mud at low water: from Wakaraya, the creek winds to the northward for one mile, where the water is nearly fresh; at the head is a deserted village, Wakarapa.

**Motute Creek**, under Direction head, is a small but useful creek, as much timber was floated down it from the forests: it extends about 3 miles in a N.N.W. direction.

**TRIBUTARY RIVERS.**—The tributary streams which empty themselves into the Hokianga river on the north side are, the Motukaraka, Maungamuka, Orewa, and Hauraki, the latter a continuation of the Hokianga itself; those on the south side are, the Waima, Omanai, and Wirinaki.

These rivers can scarcely be considered navigable for vessels drawing more than 6 feet, and the channels are generally narrow; about half-way from their source the water is fresh at half tide. Their entrances are lined with mangroves for 2 or 3 miles, when the shores approach, wooded and steep, until the boughs reach across: in some the rapids are strong after the rains.

The bed of Hokianga river is for the most part soft mud, except near the mouth, where there is in the Middle ground a hard sand bank, and for the first five miles the bottom has a sandy superficies, caused by the great sand drift from the westward, which has also impregnated the whole coast with sand for some miles into the interior; indeed, wherever the west coast has a slope sufficient to retain the deposit, it will be found to be of fine yellow sand, of depth according to the exposure.

The argillaceous white cliffs, from 15 to 30 feet high, falling perpendicular to the high water line, are common to both banks of the Hokianga river; off these, and extending along the shore, are hung boulders of iron sand-stone, some of them nearly round in shape and 30 feet in circumference; they do not, however, reach beyond the low water mark.

**Motukaraka River**, named after an island at its mouth, is the first river on the north side; it extends in a north-west direction, and has only one foot at low water at the entrance, but deepens above. The hills on both sides, about 100 feet high, are well wooded, chiefly by the puriri tree; the mangroves are extensive, but there are bold points on either side to the low water; 4 miles from the entrance is fresh water, running through a plain; there is a small native settlement at the head.

**Maungamuka River** is the next stream of any consequence; it is 2 miles above the Narrows, and is a river of considerable importance, down which most of the timber is conveyed. It is navigable for 3 miles at low water for vessels drawing under 12 feet, and the channel is more than a cable wide; above this the channels are for some distance narrow and intricate, when it improves again, and as the water becomes fresh, the timber ponds are seen on the north bank.

Five miles from the mouth, at the end of the mangroves, the hills descend steep to the water's edge, the channels are narrow, and the freshes come down with great force;  $1\frac{1}{2}$  miles above is Mongatipa village; on the south bank, opposite this village, the clay cliff is perpendicular, 30 feet high; Pungaheke village is with the windings of the river nearly 2 miles



above this; on the south bank of the river was a small settlement of Wesleyan missionary natives, above which no boat can proceed. A track from the head,—indeed, it is the main communication,—passes over the shoulder of Maungataniwa mountain to Kaitaia and Monganui in Doubtless bay.

**Orewa River**, running parallel to the Maungamuka, but of less extent, was also much used for transporting kauri spars; these, about 2 miles up the river, are still very abundant; the water soon becomes fresh, which is important for preserving the spars; the head of the river divides into three small streams, running through a raupo valley, about 4 miles from the mouth.

**Hauraki River** must be considered the termination of the Hokianga, which becomes navigable only for boats from this point; 6 miles above are the rapids. Near its source there is a road to the Bay of Islands; there was one English settler on its banks, besides Mr. M'Donnel's large station above the missionary establishment.

**Waimea River**.—This stream is on the left or southern shore of the Hokianga, below the narrows, and no doubt will be its most important tributary. At near high water, vessels of 12 feet draught could get into the river and anchor in 4 fathoms at low water, and afterwards might go up, lying safely on the mud; it runs in an easterly direction for 11 miles to the rapids. A Wesleyan mission station was within 3 miles of this, on a branch that runs to the south, and about half a mile from the river; there was an excellent bridle road from it to the Bay of Islands, a day's ride.

**Omanai River**, south of Hurd point, runs 4 miles to the eastward, and has its banks under cultivation by the natives; the hills are of moderate height, and cleared on both sides. Its navigation is similar to the other streams, and fresh water is met with 3 miles up.

**Wirinaki River**, the last tributary of any importance on the south shore, and 7 miles from the heads, presents a channel deep and broad for the first mile, but has at low water only one foot at its mouth. It had more natives on its banks than on any of the former streams described; and the creeks winding through the mangroves from the main stream, led to their habitations.

**STATIONS**.—The principal points or heads on Hokianga river were in 1854 occupied by English. Young point (*Kehotu-Mongera*), Manning point (*Onoki*), Munroe point, Hurd point (*Rawi-ne*), Mr. Russel's station (*Ko-ko-hu*), the Wesleyan mission station opposite to *Ko-ko-hu*, and Mr. M'Donnel's at Hauraki, were the principal stations. The largest native village was Pakenhae, the chief of which, Rangatira, had much land under cultivation. *Ko-ko-hu* was one of the best residences in this part of New Zealand; and its late proprietor, Mr. Russel, was the chief exporter of timber; ships of any burden may anchor off it.

**TIDES.**—It is high water full and change at the heads of Hokianga river at 9h. 45m., the tides run from 4 to 5 knots; ordinary springs rise 10 feet, neaps 7 feet; during strong westerly winds, the neaps rise as high as ordinary springs, and sometimes have been known to rise 4 feet above them; when inside the heads, the velocity of the stream decreases, being from 2 to 3 knots, until in the narrows, where it is as much as 4 knots. At the anchorage off Ko-ko-hu it is high water at 10h. 15m.

The banks of the river are everywhere approachable for boats at high water; at low water the mud flats, which commence 4 miles from the heads, are of considerable extent, generally soft and very steep-to, and extending from point to point.

On the outer coast the flood runs to the southward, and the ebb to the northward; at the distance of 3 miles off shore the strength is 2 knots and one knot at twice that distance.

**OFF-SHORE SOUNDINGS** at 10 miles will be found in about 60 fathoms green mud and sand, which decrease gradually to 30 fathoms within three miles.

The following remarks on the wind, weather, &c., were obtained from Mr. Martin, the pilot, whose experience was gained during a residence of twenty-three years at the mouth of the river.

**WIND.**—It blows the hardest and most frequently from north-west to south-west, indeed, the westerly winds are in about the proportion of 3 to one.

The heaviest gales are from south-west, and occur in the month of June.

Easterly winds are most common in the summer months, and generally draw round the south; they are looked for at the new moon, and last about three days.

The greatest quantity of rain falls in the winter months, July, August, and September.

**FOGS**, for which Hokianga river has been said to be noted, prevail in October and November, but they seldom last more than three hours, from daylight to about 8 a.m.

**GENERAL REMARKS.**—The longest time a vessel has been detained at the mouth of the river is 16 days, except once, when no vessel could get away for six weeks.

There may be about eight or nine days in the year when the bar could be crossed without a break.

The greatest number of shipping in the river, at one time, was seven, each averaging 500 tons. The accidents which have occurred during the residence of the pilot here, have been:—one vessel foundered on the north head, two struck on the bar, and a large ship lost her rudder in going out, being set on the south head by the tide, 1854.

**Fresh water.**—Between the heads and Young's point there are fresh-water streams on either side where vessels may water; the most preferable is a small stream on the north shore, one mile<sup>7</sup> from the north head; here with one boat, H.M.S. *Pandora* procured 26 tons in two days. The streams on the opposite shore are occasionally brackish.

Provisions (fresh pork) and vegetables could be obtained in any quantity.

From Hokianga river the coast continues its south-easterly trend; the land is moderately high, and the depth of water 2 miles from the shore is 20 fathoms; at the distance of 8 miles to the southward the coast becomes rocky, with large boulders, and continues so to Monganui bluff.

**MONGANUI BLUFF.**—This remarkable mountain, which is 17 miles from Hokianga, rises immediately over the sea to a height of 2,046 feet, and is thickly wooded; it is a conspicuous land mark, and can be distinguished a long distance from seaward; there is a break in the cliffs for 2 miles to the southward of it, when they again commence, and extend uninterruptedly in a straight line for 35 miles, or within 8 miles of the north head of Kaipara harbour; these cliffs are topped with sandy hillocks which reach but a short distance inshore, and are backed by a range of moderate height, which extends the whole distance parallel with the coast.

At the foot of the cliffs the whole way from Hokianga to Kaipara, a distance of 64 miles (except at the base of the Monganui bluff), is a hard sandy beach.\*

Eight miles north of Kaipara the sandy cliffs recede inland, leaving an extensive level of sand and swampy ground between them and the beach line; the sand hills at the north head of Kaipara are 200 feet higher than those along the beach.

**KAIPARA HARBOUR**† is one of the most extensive inlets in New Zealand, and it will probably become hereafter one of the most important. The entrance to it, as is the case with all the ports on the west coast, is attended with difficulties,‡ but when once within, there is perfect security for any number of vessels of the largest size; there is 700 miles of water frontage inside.

Five miles within the heads, three large rivers branch off in different directions, winding through some of the most fertile land in New Zealand,

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\* On this sandy beach, exactly midway between the two ports, the French frigate *Alcmène* ran and was totally wrecked in 1851.

† See Admiralty plan, Kaipara harbour, No. 2,614; scale,  $m = 1 \cdot 0$  inches.

‡ Many of these difficulties have been removed by the published survey of H.M.S. *Pandora*; and by the erection of conspicuous beacons on the heads, such as have been proposed by Commander Drury, the facilities for entering, and consequently the safety of shipping, will still be materially increased.

abounding with the kauri and other valuable timber, and well adapted to agricultural purposes. These rivers are navigable for many miles for vessels of large tonnage.

**The Wairoa.**—The northern branch, the Wairoa, rises in the hills (on whose northern slope the Waima, an arm of the Hokianga river, has its source) ; it extends from its mouth for 30 miles in a north-westerly direction or parallel with the coast, and at a distance of 5 miles from it ; it then takes a northerly and easterly direction, and pursues a narrow and tortuous course for an equal distance.

This branch is full of shifting sand banks, with a channel between for vessels drawing 18 to 19 feet water for a distance of 38 miles, small vessels for 70 miles.

**Otamatea**, the eastern branch, traverses the whole breadth of the island, one of its arms almost reaching the river Wangari, on the eastern coast, and has deep water for a distance of 25 miles, small vessels go 10 miles farther. Arapawa, branch of the Otamatea, is a fine deep river up to Makakohae creek.

Kaipara itself, the southern branch, flows through a valley formed by the hills, which bound the coast between Kaipara and Manuku harbours, and is only separated from an inlet of Auckland harbour by a distance of about 3 miles ; over this piece of land canoes or whale boats are dragged without difficulty.

The Kaipara district is admitted to be the richest and most extensive agricultural district in the colony. A steamer was in 1869 running regularly to the various settlements on its banks, taking the produce to Auckland.

**KAIPARA ENTRANCE** differs from Hokianga river entrance in this respect, that instead of a continuous bar across, which can only be passed by large vessels at a certain time of tide, it has a succession of sand banks, with several channels between, the main one of which, so far as depth of water is concerned, may be entered at any time, there being 5 fathoms in it at low water.\*

Three green hillocks.—In consequence of there being no distinctive features in the neighbourhood, the entrance of the port is not easily made out by a stranger.† The best natural marks for the entrance are, that the sand hills at the north head, which are 490 feet high, 200 feet higher

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\* It is surmised that this Main channel is gradually shoaling. See p. 183.

† The erection of the beacons, however, before mentioned, would in a great measure, obviate this, the seaman's greatest difficulty. Commander Drury's recommendation is, that two of the largest kauri spars should be placed, one at the high-water mark on the sand at the north head, and another on the hills some way within ; and that the same might be done with advantage on the southern side, so that having both beacons in one on either shore would lead to the exact entrance ; but should only one be seen, it would guide to the proper direction.

than those along the beach, and have three green hillocks on their face ; and that (as has been before observed) the sandy cliffs recede from the beach for some distance to the northward of the entrance.

The land south of Kaipara harbour is also higher than that to the northward, and a large green triangular tuft will be observed on the summit of a sandy range 430 feet high, 2 miles from the beach line south of the south head ; moreover in clear weather, the opening shows the dark hills on the eastern shores of the river's mouth.

The breakers, however, will generally be seen from the masthead long before the distinctions in the land are visible, the south-eastern limit of them being 6 miles from the north head, and those at the main channel entrance,  $4\frac{1}{2}$  miles from the south head. The whole extent of the outer limit of the breakers is 11 miles, encircling the mouth of the port in the form of a crescent convex to seaward.

**To enter by KEMP CHANNEL.**—The following directions are given in the New Zealand Almanac of 1874. To enter by the north-east or Kemp channel, bring the middle green hillock on North Sand head to bear N.E.  $\frac{1}{4}$  E., and the green triangular tuft called Pukitu 430 feet high, on South Sand hills to bear due East, then the course to the inner north head will be N.E.  $\frac{1}{4}$  E. ; or in clear weather, a peaked hill on east shore called Makahuranga (or Wakahuranga), 476 feet high, bearing N.E. easterly, just open of inner North head, will carry a vessel clear of all danger up to the North head.

The only channel for strangers is the north-east or Kemp, which is about one mile wide, and has 7 fathoms in mid-channel at low water.

**CHANNELS.**—At the time of Commander Drury's survey (1852) there were four channels through the outlying banks, but there is little doubt that heavy westerly gales, and the river freshes, alter the configuration of these banks and channels, and although the main channel appears to have maintained its position, others have subsequently opened. It is recommended that the pilot should notify these changes for insertion in the Colonial Government Gazette.

**Note.**—The four channels examined by Commander Drury were the following, and in their navigation he urges the necessity of piloting them aloft :—

**The North Channel** lies close along the north shore, it is very narrow, and has from  $2\frac{1}{4}$  to 3 fathoms ; it should never be taken unless under difficulties, or when a vessel by standing too far over has been drawn into it by the tide.\*

**Fanny Channel**, there is reason to believe, has opened lately (1852) ; it generally breaks across, but there are 15 feet in it at low water ; vessels

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\* The vessel *Aurora* was lost here.

have taken this for the Main channel, and have been surprised at finding such shallow water. Steering along the breakers from the northward it will be the first opening seen, but except near high water, or under favourable circumstances, no large vessels should attempt it. It has this advantage over the Main channel, that the course to the north head is nearly direct; after passing through, a north course will clear to the northward of the Tory shoal, which will be seen breaking; and when clear of it a mid-channel course may be steered between it and the north head.

**Main Channel** is 4 miles from the beach of the south head, and is nearly three-quarters of a mile wide in its narrowest part; the extremes of the banks on either side of it break heavily and mark the channel well;  $5\frac{1}{2}$  fathoms at low water will be found in mid-channel. When at the entrance the present landmarks are, the middle green hillock on the north sand head bearing N.  $\frac{1}{4}$  W., and the large green triangular tuft (elevated 430 feet on the south sand hills) E. by N.  $\frac{1}{4}$  N.

The course through the channel will be N. by E.; as the extreme of the left bank is passed, which breaks heavily, the Tory shoal is seen, distant two miles in a north-westerly direction; it is half a mile in extent. Steer so as to pass on either side of it, but the north side is preferable. Off the north sand head a spit extends for more than half a mile, which breaks and narrows the channel between it and the Tory shoal to about one mile in width; the depth here is from 20 to 25 fathoms.

If the Tory Channel be taken, which is the southern side of the Tory shoal, the width of the channel between it and the Swatchway breakers is little more than half a mile; the Swatchway breaks heavily, and has a patch on its outer edge dry at low water.

**Note.**—The courses to be steered until within the heads are so subject to the tides, which run from 4 to 6 knots, that the eye assisted by the breakers, which always show on the edges of the banks, will be the best guide to the seaman.

**The South Channel** is intricate, narrow, and not well known.\*

**Anchorage.**—On account of the strength of the tides and the great depth of water, vessels must turn into either the Kaipara or Wairoa branches before they can obtain convenient anchorage.

**Alterations (1856).**—The following information, respecting the altered character of the navigable channels of the Kaipara entrance, as also of the existence of a new channel, is derived from Mr. John Kemp master of the barque *Galatea*, as published in a colonial newspaper:—

“ From information and my own observation, I believe that the Main

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\* The vessel *Sophia Pate* was wrecked in this channel.

channel, from the entrance, to the Tory shoal, is getting shoaler every season, until perhaps in a year or two more it will not be navigable for large vessels; while the channel through which I took the *Galatea* to sea is, during the same time, becoming wider and deeper.”

“Several times while the *Galatea* was lying wind-bound off Pouto point, in August 1856, I landed and went on top of the middle green patch, Captain Drury’s bearing mark on the north head, and on each occasion could plainly see, looking about S.W.  $\frac{1}{2}$  S., a straight wide passage to sea over the outer bank; everywhere else, except in this passage, the water was paler coloured and broken.”

“The morning I got the ship under way the wind was E.N.E., which would not have taken her through the serpentine Main channel without tacking. I steered through the passage seen from the north head, and when about half-way over the outer bank the middle green patch bore N.E.  $\frac{1}{2}$  N. (magnetic). From the time we left Pouto point until we were at sea the lead was kept going, and nowhere was there less water than 9 fathoms at high water, which would leave 7 fathoms for the least depth at low water.”

“The channel through which I took the *Galatea* to sea, there is reason to believe, is the Fanny Channel noticed by Captain Drury, but now wider and deeper, and perhaps altered in position. The direct (or Kemp) channel is now the principal one, and it may remain so, having the greatest depth and greatest volume of water flowing through it. It has these advantages over the Main channel: the distance to sea from between the Tory shoal and the north spit of the channel is only 3 miles, instead of 6 miles by the Mair channel, and the tides, which run from 4 to 6 knots, set fairly through the channel, or nearly so; whereas the strong tides set across the Main channel, making it so eminently dangerous should a vessel get suddenly becalmed, which has already happened, and been attended with wreck and loss of life.”

“Should the Main channel get much shoaler, it makes it the more necessary that the pilot should have an efficient vessel to enable him to take soundings, lay down buoys, &c., and also to enable him to board ships outside the dangers, which would tend greatly to prevent the recurrence of any more such fatal accidents as have already been met with on the shoal off Kaipara heads.”

**Anchorage in Kaipara Branch.**—Having passed the breakers and being between the heads, intending to anchor in this branch, the course will be E. by N., keeping the southern shore rather on board, steering for the first headland on the starboard side, a red cliff, and avoiding the spit which forms a tongue between the Wairoa and Kaipara rivers the extreme of which is generally breaking.

After passing the red cliff keep the south shore on board for  $2\frac{1}{2}$  miles, and anchor half a mile off the shore in an open bay before reaching Omokoiti, the largest native settlement in the Kaipara, and from which place the mud flats begin to extend; the channel above being formed between banks, which are steep-to, and which is best navigated at low water, when they are dry on either side.

The general course from the anchorage off Omokoiti to Aotea, a remarkable white cliff on the south bank, is S.E. for nearly 8 miles, the channel being one mile wide. When within  $2\frac{1}{2}$  miles of the white cliff the course trends to the southward and the channel narrows.

The anchorage off Aotea is in 7 fathoms, and is the highest and safest in the Kaipara; above this the river branches off into several streams, which flow in a serpentine course to the southward and eastward; one of them reaching within three miles of an inlet of the Waitemata river or Auckland harbour.

**WAIROA BRANCH.**—To enter the Wairoa after passing the north spit, keep the north shore on board for 5 miles, until within a mile of Pouto point, the turning point of the river,—which is about 100 feet high with a flat top, where a path has been;—then edge off, as a spit extends half a mile from the shore southward of the point. Having passed the spit, keep the shore on board again, and an anchorage off the watering place will be found in from 13 to 6 fathoms; this anchorage is  $2\frac{1}{2}$  miles above Pouto point, and under the second high cliff, after passing a small islet joined to the land at low water, the valley north of the cliff has the stream. From this anchorage a pilot is required.

Three miles above the watering place is Okaru, a native village, from whence native pilots can be obtained, and until the river is buoyed, recourse should be had to their services in proceeding up this branch of the Kaipara. A monotonous range of white cliffs extend for 16 miles up the Wairoa, which runs nearly parallel with the sea coast at a distance of 5 or 6 miles, until reaching Mongawhare, 25 miles above Okaru village.

Ships took in timber at Mongawhare, where there is sufficient depth of water for any vessel in the trade, and anchorage in 4 fathoms at low water.

From Mongawhare the river runs north-easterly and becomes narrow and tortuous, but timber has been shipped as high as Omano in a vessel of 300 tons. This station, taking the windings of the river, is 21 miles above Mongawhare.

**Otamotea.**—From the heads of Kaipara harbour there are deep channels into the rivers Otamotea and Oruawharu, the eastern branches of the Kaipara: the channels lie between sand banks, and until buoyed should not be taken without a pilot. These rivers have undoubted advantages



over the other branches of the Kaipara, being near the heads, free from banks, and their shores comparatively free from mud flats, with fine soil and abundance of timber; their sources also being within a short distance of Wangari river on the east coast, will eventually make them the most valuable branches of this great estuary.

**TIDES.**—It is high water full and change at the heads of Kaipara harbour at 10h. 55m.; springs rise 10 feet, and neaps 8. In the Main channel the tide runs 4 knots. The tides vary in strength according to winds and freshes: they are strongest between the Tory shoal and North spit, and off the north entrance, until reaching the first white cliffs in the Wairoa, when the influence of the Otomotea and Oruawharu rivers may be said to cease: the ordinary springs in these parts run 5 knots, but during freshes and strong gales 6 and even 7 knots.

In the Kaipara branch, up to the first anchorage, the springs run 3 knots, above that not more than 2. In the upper parts of the Wairoa above the watering place the stream runs 3 knots, and continues at that strength until near the head of the river.

**Bore.**—Above Mongawhare a bore of considerable strength carries up the first of the flood, breaking upon the north bank. It is high water under Toka-toka, (a remarkable sharp peak on the south bank of the river 620 feet high, and 7 miles below Mongawhare,) at 12h. 23m., and at Omano, the highest distance ships can go, at 2h. 30m.

The tides outside follow the direction of the coast, the flood running south and the ebb north, but on striking the outer banks they flow and ebb directly over them, as well as through the channels. This set of the tides must be attended to in navigating these channels, and a vessel should not stand far into the great semicircular bight inside the banks with the ebb or she will be carried on them. *H.M.S. Pandora*, in prosecution of the survey, anchored close inside the great bank just north of Fanny channel; but unless in cases of emergency vessels should not anchor outside the heads.

**Caution.**—The tides of the river follow the courses of the channels. Vessels leaving Kaipara harbour should be within 3 miles of the heads at the first of the ebb, if it is intended to beat through, which is possible for a smart working ship to do. If a fair wind is considered necessary, it must be remembered that the morning land wind will rarely carry a vessel clear of danger, and will probably leave her becalmed among the breakers.\*

From **KAIPARA to MANUKAU HARBOUR**, a distance of 40 miles, is almost a straight coast and free from dangers, but no landing can be

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\* A ship, with some lives, was lost by not attending to this caution of the land wind failing, and leaving a vessel becalmed among the breakers.—Letter from Commander Drury, Jan. 7th, 1856.

effected on any part of it. Rangitera beach, a hard sand fringed with low undulating sand hills, extends for the first 24 miles south of Kaipara, and behind these sand hills, about 2 miles inland, a range of barren hills, many of them with sandy tops and faces, runs parallel with the coast, the highest of them not exceeding 550 feet.

The small island Oaia lies at the southern end of this beach, about half a mile off shore, and from it to Manukau harbour the coast is rugged and cliffy, broken here and there into sandy bays and beaches, the land rising gradually towards the north head. The cliffs for 5 miles northward of the entrance are from 600 to 800 feet high, and 2 miles from the north head is a remarkable conical peak (Ohakō) close to the sea.  $1\frac{1}{2}$  miles north of Ohakō cone is Parera a small rock, lying half a mile off shore. The coast immediately southward of Parera is fronted by a shoal, which extends one mile off and is continually breaking. The north head itself is a remarkable cone, and has two others inside it at distances of half a mile from each other.

Vessels running the coast from the northward for Manukau should keep 4 miles off shore until the marks are on for entering, as the banks extend 3 miles off the mouth of the harbour.

**MANUKAU HARBOUR.**—This extensive inlet, immediately opposite to Auckland harbour, and affording water communication within a short distance of that town, is of considerable importance, as by its means Auckland enjoys rapid communication with Taranaki and all the ports on the Western seaboard.\*

Since the survey by Captain Drury, R.N., in 1853, it has been found that the main channel into Manukau harbour has narrowed by the growth of the banks on both sides, the outer of the middle banks having extended its northern edge fully half a mile, and upon which in February 1863 H.M.S. *Orpheus* first struck, and subsequently became wrecked by again grounding on the next shoal of the middle banks, which shoal had also greatly extended its northern edge. The Orwell bank on the north side of the main channel has also extended its southern edge; the old marks therefore are no longer of any use, and consequently the strictest attention to local directions is necessary, and which directions are given by signals from the Pilot station on Paratutai, as appended hereafter.

Besides the main channel there are two others, the North and South channels. The North is about half a mile wide, and said to have 3 fathoms at low water; but it cannot be recommended.

The South channel into the harbour is the one now used and it often

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\* See Admiralty plan, Manukau harbour, 2,726, scale  $m=1\cdot5$ .


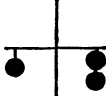
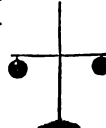

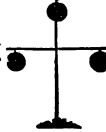


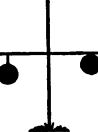
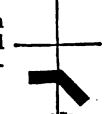
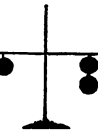
happens in ordinary weather at sea, that when the bar and middle banks break heavily, the water is smooth in the South channel, which appears to carry nearly the same depth as the bar.

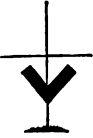


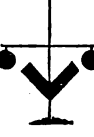


**CAUTION.**—Sitated, however, as Manukau harbour is, on an open and exposed coast, with a shifting bar at the entrance of its main channel, at the distance of 3 miles from the land, the harbour has so many dangers obstructing its several channels, as to make it imperatively necessary for attention being paid to the latest local directions, and the greatest precaution being observed by the mariner.

Although there does not appear to be less than 21 feet at low-water springs in the channel on the bar, vessels of large draught, or any one not thoroughly acquainted with the local signals, should not attempt to enter the Manukau harbour without a pilot.

The banks being subject to constant change and the buoys frequently adrift, masters of vessels must exercise the greatest caution in approaching the harbour, and pay close attention to the steering signals from the pilot station, keeping the lead constantly going.

**Signals.**—The following local signals for Manukau harbour were approved by the New Zealand Government in December 1873, and supersede those formerly in use.

- |  |   |  |   |
|--|---|--|---|
| <p>1. One ball at mast-head—<br/><i>Wait for flood tide.</i></p>   |   | <p>6. When the ball at north yard-arm is lowered half-way down in connection with signal for steam or sailing vessel, it will mean—<br/><i>Take Fanny channel.</i></p> |  <p style="text-align: center;">OR</p>  |
| <p>2. One ball at mast-head, and north semaphore arm pointed up—<i>Wait for half flood.</i></p>                        |  | <p>7. One ball at mast-head, and at each yard-arm — <i>Bar dangerous.</i></p>  |   |
| <p>3. One ball at mast-head, with both semaphore arms pointed up—<i>Wait for high water.</i></p>                       |  | <p>8. Both semaphore arms pointed down — <i>No wind about the heads.</i></p>   |   |
| <p>4. One ball at each yard-arm — <i>Steam vessel take South channel.</i></p>  |  | <p>9. North semaphore arm pointed horizontally, and south arm downwards—<br/><i>Come to an anchor.</i></p>   |   |
| <p>5. Two balls vertical at south yard-arm, and one at north yard-arm — <i>Sailing vessel, take South channel.</i></p> |  |  |   |

- |   |   |  |   |
|---|---|--|---|
| <p>10. Both semaphore arms pointed upwards—<i>Remain at anchor, or Wait for signal.</i></p>       |  | <p>13. North semaphore arm pointed up, and one ball at north yard-arm—<i>A vessel in danger and wanting assistance.</i></p>  |  |
| <p>11. South semaphore arm pointed upwards, and north arm downwards—<i>Will send a pilot.</i></p> |  | <p>14. Both semaphore arms pointed up, and a ball at each yard arm—<i>A steamer is coming to your assistance.</i></p>  |  |
| <p>12. Both semaphore arms pointed horizontally—<i>Get under weigh.</i></p>                       |  | <p>15. When the signals are intended for vessels <b>OUTWARD BOUND</b>, an <i>extra signal</i> in the form of T, painted red, will be shown below the yard on the mast.</p> |  |
16. The semaphore arms will be used for piloting vessels in and out of the harbour when required. The vessel being piloted by the semaphore is to be steered in the direction in which the semaphore arm is pointed; and when the arm is dropped, the vessel is to be kept steady as she goes.

NOTE.—*The illustrations are shown as they will appear from seaward.*

**Entrance.**—The heads are easily distinguished, the coast gradually increasing in elevation from Kaipara to Manukau, where the hills on the north shore rise to the height of 1,280 feet. To the north of the port the country is an extensive forest, while all that facing seaward to the southward is peculiarly barren for 20 miles; but the most conspicuous objects first visible from the westward are three conical peaks near the North head, one of them forms the island Paratutai, and may be considered as the North head, being connected at low water; it is 335 feet above the sea; about three quarters of a mile from it, inside the harbour, on the side of the hill, north side of entrance, are three beacons, which are steering marks for the south channel. The South head presents a rounded barren face of brown soil, with table land extending southward.

**LIGHT.**—On the brow of the South head bluff, from a tower 20 feet high, a fixed white light is exhibited at an elevation of 385 feet above the level of the sea, visible from seaward between the bearings of N. by W.  $\frac{1}{4}$  W. and E. by S.  $\frac{1}{4}$  S., and should be seen in clear weather a distance of 26 miles.

**Caution.** — Although the light may be seen from a long distance seaward in clear weather, its limit of visibility will be much smaller in thick weather, and great care should be taken in approaching the shoals, which extend so far from Manukau entrance.

**THE BAR** of the main channel, a cable in breadth, is 3 miles from

Paratutai ; the least water at low-water springs is 21 feet in the channel on the bar.

The soundings from seaward to the bar decrease very gradually to 12 fathoms, which will be found on the outer edge ; and from that depth it shoals suddenly, increasing again within from 7 to 17 fathoms.

The natural marks for leading into Manukau harbour are very conspicuous ; but from the shifting nature of all the bar harbours on the West coast of the North island, the seaman is *cautioned* to pay strict attention to directions that may be given from the Pilot station, and it has been recommended as a general rule, in the absence of direct information of change in the channels, that that portion which has the smoothest water between the breakers should be taken, as experience has proved that it will be the deepest part.

The leading mark used in 1864 was the Nine Pin rock, in line with the tangent of the inner point of the South head, but as there is the same depth, viz.— $3\frac{1}{2}$  fathoms a little to the Northward, and the banks have a tendency to extend themselves yet more in that direction, it would be better to bring the Nine Pin rock in line either with a projection, half way up the slope (Nib), or with the inner part of the Sand Cliff on South head, for crossing the Bar.

When inside the south spit or outer middle bank bring Puponga point open of Paratutai, steering along the middle banks to avoid the Orwell shoal, which runs about a mile W.S.W. The dangers are plainly seen on both sides of the channel, except at high water, during a long continuation of fine easterly weather.

Pass a cable from the Ninepin to avoid a sandpit, which extends to the south-west of it ; but when it bears North, steer for and keep as near to Paratutai as convenient.

The following information is from the New Zealand Almanac, 1874 : —“Manukau has three different channels, viz., North, Main, and South ; the two former are the only channels a large ship could enter by, but owing to the want of leading marks, and the distance of the entrance from the Signal staff, the Southern channel is now the only one used ; in it the least water found is  $2\frac{1}{2}$  fathoms, the tides are strong, and the channel shifts after strong south-west gales ; buoys have been laid down, but their position cannot be relied on ; the two leading beacons on the South head do not always show directly through the Fair-way, therefore vessels going in or out should pay particular attention to steering, by keeping the vessel in the direction in which the semaphore arm on the Signal staff points, and steadying the helm the moment the arm drops. Vessels making for the South channel should bring the South head to bear N.N.E.  $\frac{1}{2}$  E., running on that course until the signal mast is made out, then the course steered

should be as directed by the semaphore arm,\* until the three beacons on the north side of the entrance are brought in one, the course must then be sharply altered and care taken to keep them in one till the harbour is well open. The pilot, if necessary, will board inside the entrance; should there be no pilot, and bound to Onehunga, keep the red buoys on the starboard, and black on the port hand. A fixed white light is now shown on the south entrance side."

The south head is one mile inside the north head; a spit extends from the former towards Paratutai for two-thirds of a mile; there are 7 feet on the end of this spit, and it narrows the channel to half a mile. A buoy has been placed on it.

After passing this spit the channel is clear to Puponga, a distance of 5 miles, the depth gradually decreasing from 20 fathoms; it is not advisable to anchor until rounding this point on the north shore, or Mako point, which is nearly opposite it on the south side; but if necessary, the Huia banks afford anchorage in from 5 to 6 fathoms, nearly 2 miles before reaching Puponga. There is shoal water extending off the Huia one mile to the westward of Puponga point, but by keeping the Nine Pin open of Paratutai the outer edge of it will be cleared.

After rounding Puponga point, vessels bound up the northern or Wairopa channel should haul up to avoid the tail of the mud flats, between which and Puponga there is a channel of scarcely half a mile; good anchorage will then be found in 4 fathoms, half a mile above the point, and about a third of a mile off shore; with a leading wind vessels can proceed as far as Shag point, 5 miles above Puponga, if the banks are visible, the channel being a third of a mile wide, and the course along the coast, taking care not to get within the line of the points.

Vessels going to Papakura or Waiuku should proceed to an anchorage, off Kauri point, in from 8 to 10 fathoms. The course to this anchorage, which is little more than 2 miles from Mako point, is, after passing the latter to keep the shore on board within a third of a mile, to avoid the flats, which dry at low water. Should a vessel arrive off Paratutai and be unable to obtain a pilot, the best place to anchor is half a mile above Puponga point, where he would be seen from Onehunga and a pilot would come down. No vessel of more than 15 feet draught should go above Shag point without mooring head and stern. The best place is about a quarter of a mile below the White bluff in 18 feet low springs.

**TIDES.**—It is high water at the entrance of Manukau harbour, on full and change, at 9h. 30m.; springs rise 13 feet, neaps 10 feet. Tides above Puponga, both in the Wairopa and Waiuku channels average  $2\frac{1}{2}$  knots at springs. In the narrow part of the channel off Paratutai

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\* See paragraph 16 of Signal instructions, page 189.

they run 4 knots, and on the bar outside from 1 to 2 knots; on the outer coast the flood sets to the south and the ebb to the north. The tides within take the direction of the channels, and are not strong on the banks even when well covered, which is a good guide for navigation, but until these channels are buoyed, they should be navigated when the tide shows the banks, or with boats ahead.

Vessels should not attempt to enter Manukau harbour against the strength of the ebb, unless with a commanding breeze.

The following remarks are by Mr. Wing, pilot and harbour-master, made during an experience of over a quarter of a century :

“Care should be taken to guard against the cross-tides about the spits and swatchways.

“The prevailing winds are from north-west to south-west, and it seldom blows a gale from the Southward—the wind moderating as it draws from south-west towards South.

“Easterly gales are not frequent, and generally shift suddenly to the westward, in a violent squall with very heavy rain.

“The gales rarely continue long in one quarter, and a strong breeze from north-west or even W.S.W. (as a rule) does not cause a heavy sea in the South channel, which can be taken with safety towards high water.

“The Bar, with such winds, generally speaking, breaks, and dangerously, towards low water; but in case the gale gets to the south-west the sea will break right across both channels, but less across the South channel, which is never at any time so dangerous as the Main channel. This, however, is of short duration, and seldom lasts over a day and a night, when by the morning it becomes moderate, and the South channel free of break (even though there be considerable swell outside and the banks breaking heavily), and safe to enter at proper time of tide, say at half flood, or even at first quarter ebb, with a commanding breeze or steam.”

**INNER WATERS of MANUKAU HARBOUR.**—From the Puponga peninsula, Manukau harbour expands to a breadth of 15 miles by 12, having three channels navigable for vessels of any tonnage to three equidistant and valuable districts (viz.), Onehunga, Papakura, and Waiuku.

These channels are with slight exceptions nearly straight, and having dry banks on either side at low water, they offer a sheltered anchorage in any part; they carry their depth up to within the heads of Waiuku and Papakura, and nearly up to Onehunga.

There are also two deep channels leading along the north shore; one branching off, Onehunga middle channel (*Wairopa*), at Shag point, leads to the Wahau portage, and joins the middle channel again just before reaching cape Horn, though at this point it is only navigable for vessels of burthen at high water.

The other, outer Onehunga channel (*Purakau*), comes up direct from Puponga point, and would have been the best channel to Onehunga, but

that it fails in depth where it enters the Middle channel, at cape Horn; it is useful to the lands around Puketutu, and indeed is generally available, as it would have 22 feet at high water, where it is most difficult. The general nature of the bottom in all these channels is a greenish sand and mud, good holding ground. The tides within them average at springs  $2\frac{1}{4}$  knots; there are no rocks and no uneven ground, and the banks, being soft sand and shells, are not likely to injure a vessel on touching.

One tide will suffice to carry a vessel from the heads, with a leading wind, to either of the above districts.

It will be observed that these remarks are suited for vessels of any burthen, but the Manukau flats can be traversed by boats, according to the tides, and, unlike the banks outside, there is the smoothest water over them, the tide taking the course of the channels. The banks are generally covered soon after the first quarter flood, but they vary in height; and some are never uncovered, especially those facing the Waiukua channel, where there is generally 4 feet at low water, and only small spots that dry. Having made these general observations on the different channels, we now come to their more immediate description.

**ONEHUNGA** middle or main channel leads along the north shore from Puponga point; a flat extends from the village of Karangahapi, which lies in the bight,  $1\frac{1}{4}$  miles north of Puponga, off which there is good anchorage.

From Karangahapi there is a straight channel to Shag point (*Okewhu*) one-third of a mile broad, with  $4\frac{1}{2}$  fathoms at low water: the distance from Puponga to Shag point is nearly 5 miles.

At Shag point the channel divides, the inner one being along the coast has a depth of 3 fathoms near the Wahau portage, but as before mentioned difficult at cape Horn.

The main channel takes an easterly direction from Shag point, turning in again towards cape Horn; its width is little more than a cable, with from 3 to 4 fathoms at low water; at the junction of the three branches near that cape, the least water is 13 feet.

**Cape Horn** (*Matengahe*) is  $2\frac{3}{4}$  miles below Onehunga; it is steep-to, as are also some of the other points before reaching the settlement, and as the flat extending from the town renders shipment very inconvenient, these headlands will probably be valuable, besides being about the nearest points to Auckland. The anchorage is also wider than that immediately off the lower end of Onehunga, where there is, however, a pool of 3 fathoms at low water. The general anchorage would be about a quarter of a mile below the white cliff (*Tetapere*), in 18 feet at low water.

**ONEHUNGA** is a port of entry about 6 miles south of Auckland by land, and has a large population. There is a fine level macadamised road, bordered



by substantially fenced farms, handsome suburban villas, and market gardens, leading from Auckland to Onehunga. The railway from Auckland to the Waikato country passes this village, which is pleasantly situated on a gently rising slope from the beach, and promises to become (1874) a very important commercial and shipping port, as it is found that steamers can reach Sydney or Melbourne in a shorter time, sailing from the Manukau than from Auckland, or any of the southern ports, and having in its vicinity iron sand, iron stone, and coal in great abundance. The facilities afforded by the railway just opened will rapidly increase the business and manufactures of Onehunga.

The coast up to Onehunga is generally formed by low perpendicular cliffs: there are two broad creeks of no depth, besides several smaller streams in the various bights. The points are of soft grey level sandstone, extending in straight layers from the points to the south-west, but in some instances taking a curvilinear form. Karangahapi bay has deep iron sand.

**Purakau** or the outer Onehunga channel runs, as before observed, from Puponga point, between the banks, straight for Puketutu island. It has an average width of a quarter of a mile, and carries from 6 to 7 fathoms at low water to within three-quarters of a mile of that island. It then takes a direction for cape Horn, and becomes narrower and somewhat intricate: at its junction with the middle channel at that point there are only 9 feet at low water.

**Papakura Channel**, cutting through the middle of the flats, runs to the eastward for 12 miles; it has from 8 to 10 fathoms for the first 3 miles, and not less than 4 fathoms to within the heads, where there is anchorage in  $4\frac{1}{2}$  fathoms.\*

The Wata Paka creek falls into this channel from the southward, 4 miles from the entrance, having from 3 to 4 fathoms for  $1\frac{1}{2}$  miles up, when it becomes narrow and winding, with half a fathom to its head.

Another creek, the Pukaki, joins 2 miles above this from the northward, having a good boat channel.

**Waiuku Channel**, commencing from Te-Hopono point, opposite to Puponga, runs along the shore to the southward. For 6 miles to the heads (Karaka and Tokaroa points) there is from 5 to 8 fathoms water until nearing these points, when the depth decreases to 4 fathoms.†

The channel leads close to Karaka point, a reef and bank extending a considerable distance off the opposite point: there is a hole of 17 fathoms

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\* Extensive coal fields have been discovered at the head of this channel, which the intercolonial steam vessels avail themselves of.

† A pinnacle rock is said to exist midway between Karaka and the opposite shore of the channel, but we searched for it in vain.—Remarks by Captain Drury, R.N.

between, and 6 fathoms after passing them, in which depth there is anchorage one mile within.

Above Karaka point the river runs to the south-east for 4 miles, and vessels drawing 12 feet may go up as far as the narrows, which are  $4\frac{1}{2}$  miles above that point.

The Taihiki, a tributary of the Waiuku, one mile within Karaka point, is navigable for vessels drawing 12 feet for 2 miles. The channel up the Waiuku is along the coast, and it is generally steep from point to point.

**COAST from MANUKAU to WAI-KATO RIVER**, a distance of 22 miles in a S.E.  $\frac{1}{2}$  S. direction, is a sandy beach, with barren-looking table-land facing seaward.

**WAI-KATO RIVER\*** is one of the largest rivers in New Zealand; it takes its rises about the centre of the island in Tongoriro mountain, and has several branches; the principal of which is the Waipa; it has a shifting bar, and is only accessible to small vessels; it is said to be navigable for vessels of 30 tons, for 60 or 70 miles, and for a much greater distance for boats; there are  $3\frac{1}{2}$  fathoms at low water, within the entrance. The north entrance point is composed of sand-hills, while the land on the south side is bold, rising from 500 to 600 feet; a mountain 1,230 feet high (*Terua-tui-tui*) lies N.E. by E.  $4\frac{1}{2}$  miles from the entrance.

**Beacon.**—Two white beacons have been erected on the north bank; they are 25 feet high and 200 feet apart; when in line, they lead over the deepest part of the bar.

**Directions.**—When near the Waikato do not shut in Oruaranghi point (a point 3 miles southward of the entrance) until the Fairway beacons are in one, bearing N.E. by E.  $\frac{1}{2}$  E. Easterly; then proceed over the bar with them in line. When just over the bar, the water will deepen 5 or 6 feet; keep the marks on until a sandy cliff on the South head is about to shut in, when steer for Putataka. When the Mission house is touching a yellow cliff on the west side of Putataka, see that the small black beacons are still open, to avoid the five-foot bank to Northward of channel.

If wishing to bring up to the eastward of Putataka, anchor so as to swing clear of a 4-foot rock, E. by N., one cable from the point, and the shoal water to the northward of the channel. If the vessel is 150 feet long, she must moor, but can lie at single anchor to the north-west of the point. The tide is less strong to the Eastward of the point.

In going out from Putataka, steer for the mouth of the river, keeping the black beacons open to avoid the 5-foot bank.

Bring the Fairway beacons in line when the Sandy cliff is about

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\* See Admiralty chart, Manukau harbour to cape Egmont, No. 2,535; scale  $m = 0 \cdot 25$ .

to open itself, and proceed across the bar. Keep the marks on until Oruarangi point is well open, which will clear the breakers at the entrance.

The least water on the Bar, with the Fairway beacons in line, is 12 feet 6 inches at low water spring tides; but there is a depth of 10 feet a short distance to the Northward, and 11 feet the same to the Southward, so that the marks should not be opened much.

The beacons when in line appear on with the middle of an easily recognized gully.

The Eastern beacon is on White Shell summit; the Western beacon a quarter of a mile S.W. by W.  $\frac{1}{2}$  W. from it on a little mound.

The spits at the entrance appear to have shifted since Captain Drury surveyed the Waikato, as the present Fairway magnetic bearing differs  $4^{\circ}$  or nearly half a point from the old one.\*

**THE COAST.**—From Wai-kato river the coast trends S.S.E.  $\frac{1}{2}$  E. for 20 miles to Whaingaroa harbour; the only off-lying danger is the Kapiapia rock, a black rock about 20 feet high, lying one mile off the coast, 7 miles southward of the south head of Wai-kato. The points are generally cliffy, with scattered rocks extending about a quarter of a mile off them, and sandy beaches between.

The land is moderately high and undulating, being from 300 to 600 feet above the sea.

**SOUNDINGS.**—The soundings off this part of the coast are, at the distance of 10 miles, 28 fathoms, gray sand, shoaling gradually to 16 fathoms within 4 miles of the beach.

**WHAINGAROA HARBOUR**† (or port Raglan, from a town of that name being recently established on its shores,) may be known by Karehoe mountain, of conical shape, rising immediately over Woody head, the outer south entrance head, to a height of 2,370 feet; it is an excellent landmark.

The harbour is just to the northward of the mountain, in a bight formed between it and the land running towards Wai-kato. When the bight is made, the entrance will be distinguished by a reddish cliff hill over the south head; the north head is low and sandy, with high woody land behind; the south point is also low, but not sandy, and slopes down from the reddish cliff hill just mentioned.

The bar is a mile outside the entrance, which is formed by two spits dry nearly half way out at low water, the passage between them being 2 cables wide; the marks for crossing it were, in 1866, a large white

\* Directions by Mr. J. G. Boulton, R.N., Assistant Surveyor.

† See Admiralty plan, Whaingaroa harbour No. 2,534; scale,  $m=4\cdot0$  inches, by Commander Drury, R.N., 1854.

house in the town, its own breadth open of Rangitoto point, or the two beacons on Ann point in one, which lead in on an E.N.E. course, these marks lead over the bar in 3 fathoms at high water. Ann point gradually slopes from a low hill  $2\frac{1}{2}$  miles inside the entrance.\*

The beacons are painted *red*, one being higher than the other, and are posts with barrels on them.

**Soundings.**—In approaching Whaingaroa, the water shoals regularly from 8 fathoms, 2 miles off, to 9 feet, which is the least depth on the bar at low-water springs: the channel is straight in from the bar to the heads, carrying in 2, 3, 4, and 5 fathoms when between them. Vessels may sail up to where the harbour branches off into the Whaingaroa and Waite-tuna rivers, which are 3 miles from the entrance.†

A course rather to the northward of mid-channel should be steered until nearly abreast Ann point, when a vessel should haul over slightly towards the south shore, to avoid a shoal which extends from the north side between Mata-whereo and Mata Kokaku points.

**Anchorage.**—There is good anchorage off Mata Kokaku point, above the greatest strength of the tides; indeed a vessel may anchor in any part of the harbour. Small vessels generally anchor off the first limestone rocks above the north head, near Houe village, in 9 fathoms. On a creek on the south side, one mile inside the entrance, is a Wesleyan Mission station.

**Tides.**—It is high water full and change on the bar of Whaingaroa harbour at 9h. 50m.; rise 12 feet.

The strength of the tides between the heads is from 4 to 6 knots; a mile above, from  $2\frac{1}{2}$  to 3 knots; and at the anchorage of Mata Kokaku point, from  $1\frac{1}{2}$  to 2 knots.

**GANNET ISLAND**, a small island about half a mile in circumference, white with guano, and 70 feet high, with rocks extending a quarter of a mile to the south-west of it, bears S.W.  $\frac{1}{2}$  S.  $13\frac{1}{2}$  miles from Woody head, and N.W.  $\frac{1}{4}$  W.  $11\frac{1}{4}$  miles from Albatross point; there are 30 fathoms water at the distance of one mile all round, and 20 fathoms midway between it and the coast; it is generally covered with gannets.

**AOTEA HARBOUR.**‡—From Woody head the coast trends nearly south; the country hilly and wooded. Aotea harbour lies  $10\frac{1}{2}$  miles to the southward of Woody head, and 8 miles north of Albatross point; the entrance is also  $11\frac{1}{2}$  miles east of Gannet island.

\* Commander Freemantle, R.N., 1866.

† This anchorage is much more considerable than Kawhia, and I consider the harbour better and easier of access. The bar is quite straight, and practically has as much water over it as the Kawhia bar. From the 21st April to 3rd May the bar was breaking dangerously, owing to south-west gales.—Remarks by Commander Freemantle, H.M.S. *Eclipse*, 1866.

‡ See Admiralty chart, Manukau harbour to cape Egmont, No. 2,535; scale,  $m=0\cdot25$ .

On approaching it from seaward the entrance has the appearance of a great gap, with sand-hills on either side; the south point, *Kapua-te-manua*, has a darker summit than the rest of the hills on the coast, and is 380 feet high; the north head is a low point, 44 feet in height, formed by the gradual slope of the sand-hills.

**Outlying Rocks.**—Off the north head, and one mile from the land, are two rocks; the northern (*Ewhatu*) is awash at low water, and nearly always breaking; it bears from the north head W.  $\frac{3}{4}$  N., and from the bar N.W. by N.  $1\frac{1}{2}$  miles from either. The south rock, which seldom breaks, is a quarter of a mile south of *Ewhatu*; there is deep water round and between them.

**The BAR.\***—The width between the heads at high water is three-quarters of a mile, but from the north head a long sand spit, dry at half-tide, runs to the southward for one mile; and half a mile southward of the south head the south spit runs off, and outlies the north one, drying at low water about one-third of a mile out.

**Directions.**—In steering for the bar, two small triangular patches of yellow cliff to the right of the south point will be seen; the right of these patches in line with where the summit of the dark hill over the south head meets the sand-hill, or where they appear to join, bearing E.  $\frac{3}{4}$  N., leads over the bar in 11 feet at low water; after crossing the bar, which is about a cable in width, haul in along the spit E.S.E. until abreast the tail of the north spit, which is always showing, then gradually haul up, keeping the north spit on board, to the north head; still keep the north shore on board at  $1\frac{1}{2}$  cables distance, as there is an extensive sand-flat on the south shore.

When abreast *Punga-punga* point, edge over to the southward half a cable, to avoid a tongue with 4 feet on it; and when abreast the abrupt termination of the sand on the north shore, steer for the red cliffs on the south side, and anchor off them in from 4 to 6 fathoms.

The depth of water in the channel from the heads to *Punga-punga* point is from 2 to 4 fathoms at low water; it continues to the eastward three-quarters of a mile towards the white bluffs, when it turns to the northward, and divides into three small channels, the westernmost leading to the Mission station, above which it is dry; the middle towards *Pakaka* creek, dry at low water; and the eastern channel to *Makamaka* creek, also dry at low water.

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\* It must be observed that this description of the bar and channels resulted from the survey made by Commander Drury in 1854; but as there is reason to believe that river freshes and westerly gales tend to vary the conformation of the spits and the depth of the channels, it is advisable to pilot vessels from aloft; and it has been recommended that telegraphic arrangements, similar to those existing at *Manukau* and *Hokianga*, should be established at all the ports southward of the former harbour.

**Tides.**—It is high water full and change on the bar of Aotea harbour at 10h., and the springs rise 12 feet, neaps 9 feet; between the heads the tides run from 3 to 5 knots, and at the anchorage off the Red cliffs from 2 to 4 knots.

**KAWHIA HARBOUR\*** is 5 miles south of Aotea harbour; it is the most considerable inlet on the west coast, south of Manukau harbour.

The approach to it is well marked from seaward by the distant mountains of Pironghia, which rise in notched summits, 15 miles inland, to the height of 2,800 feet, also by the high wooded headland to the northward Woody head, as well as by the bold craggy land of Albatross point on the south side, which extends 5 miles to the westward of the port and forms the bight in which it lies.

The harbour bears from Gannet island E.S.E. 13 miles distant. It has a bar entrance, which is  $1\frac{1}{2}$  miles distant W.N.W. from the heads. There are two channels in,—the north and south,—which are separated from each other by a bank nearly half a mile in extent, with less than a fathom on it at low water.

The south channel is the best and deepest, being nearly two cables wide, with 14 feet in it at low water; the northern is not so wide, and only carries 11 feet over it; moreover, in westerly winds, there is a heavy a-beam sea in crossing it.†

The south head is double, forming two distinct cliffy points a quarter of a mile apart, with a sandy bight between, and rocks extending off both, visible, and not detached: the inner head, which appears as and is called the south head, is 110 feet high, and has a very conspicuous yellow patch on it. The north head is a low sandy point, the termination of the sand-hills which stretch the whole distance between Aotea and this harbour.

**South channel.**—In approaching from the westward, as soon as the Pironghia mountains 15 miles inland, 2,800 feet high are made, steer for them, until Albatross point shuts in the land to the southward, which will be about 5 miles from the shore. Then to enter the south channel, bring the south head to bear E.S.E., and steer for it until the leading mark inside becomes visible on the same bearing: this mark is an arched cliff of a reddish colour and dotted with trees, 3 miles within this entrance. Keep this cliff a little open of the extreme of the south head, bearing E. by S.  $\frac{3}{4}$  S., and steer in on that course with these marks on: or as this cliff is now overgrown with shrubs, a nearly square white cliff (a little to the southward of the arched cliff) in the gap between the south head and the large rock

\* See Admiralty plan of Kawhia harbour, No. 2,524, by Commander Drury, R.N., 1854; scale,  $m=3\cdot0$  inches.

† See foot note, page 198.

off it, will lead in on the same bearing, the water will be found to shoal gradually from 10 fathoms one mile outside the bar to 14 feet at low water when on it.

When this latter depth is obtained, haul up towards the north sandy head to avoid the south bank, which the channel leads rather close to ; and having run three cables there will be  $3\frac{1}{4}$  fathoms, when steer direct between the heads E. by S.  $\frac{1}{4}$  S. until 2 cables within the inner south head, or until the outer south head is just open of the extreme of the rocks off the inner head ; then haul up the left channel, steering E.N.E. towards Leathart point.

The channel which for the first mile is between sand-banks, is little more than a cable wide, with 4 and 5 fathoms ; the banks will be distinguished by the stream ; there are only 2 or 3 feet on them at low water. After passing them, which will be half a mile before reaching Leathart point, steer for that point ; there are 6 fathoms within half a cable of it, and anchor half a mile above, a cable off shore, in 4 fathoms, abreast the native church.

**North channel.**—The marks for crossing the bar by the north channel are, Mr. Joseph's house on Ohaua point, (two miles within the entrance,) just open of the rock off the south head, bearing S.E.  $\frac{1}{4}$  E. ; steer in with these marks until in deep water,—5 or 6 fathoms,—or until within three cables of the heads, when keep between them, and the same directions previously given will hold good. There is anchorage in the southern arm for small vessels, by rounding the south head at the distance of less than a cable, and keeping along the south shore for about half a mile.

When within Kawhia harbour, and the flats are covered, the harbour presents a considerable expanse of water, six miles in length by four in width ; but when the tide is out, the channels leading to the rivers Oparau Awaroa, Rakau-nui, and Wai-haerekiki are all plainly visible, and easily navigable for small vessels for a considerable distance.

**TIDES.**—The time of high water full and change on the bar of Kawhia harbour is 9h. 30m. ; the rise 12 feet. The strength of the tides between the heads is from 4 to 6 knots ; when within, from 2 to 4 : the ebb tide sets over on the south spit, with a slight inclination to the southward, and the flood in the contrary direction.

In the bay outside between the south head of Kawhia and Albatross point, there are from 4 to 8 fathoms, sandy bottom, where there would be anchorage in fine weather with off-shore winds.

**COAST SOUTHWARD of KAWHIA.**—Albatross point is 600 feet high, bare and clifty to seaward, having detached rocks within a cable ; during south-west winds, and with the ebb tide, there is a great sea off this point, and vessels bound to or from Kawhia should give it a berth ; between it

and New Plymouth, an extent of 70 miles of coast, there is no place of shelter except the small rivers Mokau and Waitera, which are alone eligible for coasters in fine weather.

For the first 18 miles the coast trends south, with a slight curve to Terua point, which is 400 feet high, and from the northward shows as a light yellow cliff; some scattered rocks extend a short distance off the points, but no dangers are believed to exist within one mile of the shore.

**Tokama-puna Rock.**—Off the Marakopa river, 12 miles south of Albatross point, a rock awash (*Tokama-puna*) lies half a mile distant, and there is also a reef awash nearly one mile north of Terua point. Whare-orino mountain, 2,074 feet high, rises over this point, and the land immediately over the coast one mile north of it is 1,000 feet above the sea.

**Soundings.**—At the distance of 15 miles off shore there are 40 fathoms grey sand, and as far as soundings have been obtained, this depth decreases regularly to 34 and 26 fathoms at distances of 10 and 5 miles from the land.

From Terua point the coast continues its southerly trend almost straight, and without presenting any remarkable feature to Mokau river, a distance of 19 miles from it, and 35 from New Plymouth.

**MOKAU RIVER.**—This river, which takes its rise in the Rangitoto mountain range, is resorted to by coasters engaged in the native trade; it has only 2 feet water over its bar at low-water springs, and at high water 14 feet: vessels of 20 tons cross it under favourable circumstances, and there is good anchorage within: it is navigable for boats for many miles, but is subject to heavy freshes. Coal is found here.

**The COAST.**—From Mokau river the coast runs S. by W. nearly 20 miles, when it suddenly takes a westerly trend towards the roadstead of New Plymouth and cape Egmont. Southward of Mokau river, the coast is composed of yellow sandstone cliffs, about 100 feet high, on which the constant action of the sea has produced a curious effect, isolating portions of the projecting points, and wearing them into pillars of the most fantastic shapes.

The White bluff (*Parinini*), a very remarkable cliff 900 feet high, and visible a long distance from seaward, lies 10 miles south of Mokau river.

From Pari-okari-wa, a projecting point 2 miles southward of this bluff, a long reef extends for 2 miles to the northward, and breaks only in heavy weather.

Between the rivers Mohau and Waitera there are several streams, most of them fordable at low water.



**WAITERA RIVER** is 8 miles north-eastward of New Plymouth, and is often run for by coasting vessels on the approach of bad weather at that roadstead, as well as for purposes of trade with the natives: there is not more than 2 feet water on its bar at low springs, but the tide ranges 12 feet. The anchorage is off the native village a quarter of a mile within the entrance, in 3 or 4 fathoms. The river is navigable for boats a distance of 4 miles.

**Night Signals.**—From the shore, two *red* lights vertical, signifies take the bar; two lights vertical, *red* over white, signifies, bar dangerous. From vessel, two white lights horizontal with one *red* over, forming a triangle, signifies, want to come in before daylight. Vessels approaching New Plymouth, or Waitera at night, requiring a pilot, should fire a gun, and burn blue lights.

**TIDES.**—The flood-stream from the northward meets the flood-stream from Cook strait in the vicinity of Gannet island, about 80 miles to the northward of cape Egmont.

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## CHAPTER VII.

EAST COAST OF THE MIDDLE ISLAND.—FROM CAPE CAMPBELL TO  
THE EASTERN ENTRANCE OF FOVEAUX STRAIT.\*

## VARIATION IN 1875.

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Cape Campbell	-	15° 20' East.		Banks Peninsula	-	15° 55' East.
				Otago		16° 40' East.

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**CAPE CAMPBELL**, the north-east extreme of the Middle island, will be found fully described at page 141. A low dangerous reef with a sunken rock off its extreme extends nearly one mile to the north-north-east of the low extreme of the cape, and rocky patches extend off the shore almost the same distance for some miles to the southward.

**Caution.**—It is advisable that vessels should not approach the land in this neighbourhood within half a league or two miles by day, unless coasters acquainted with the dangers; and especially at night, and in thick weather, great caution must be observed when in its vicinity, although now well lighted.

**LIGHT.**—For description of light, see page 141.

**The COAST from Cape Campbell to Kaikora Peninsula.**—The coast trends from Cape Campbell S.S.W., and is rocky for the first 9 miles to the small river Waiharakaka, at the entrance of which is Flaxburn,† and where in fine weather, there is landing for boats sheltered by the reefs; there is also temporary anchorage for coasters, with north-west winds, in 10 and 11 fathoms, one mile from the shore. The coast southward of Waiharakaka is sand and shingle beaches, with rocky points, for 22 miles to Waipapa point, and the steep spurs descending from Benmore mountain, which rises over Flaxburn to a height of 4,360 feet, as well as those from the lofty Kaikora mountains to the southward, give to the neighbouring coast a peculiarly bold and rugged appearance.

Immediately south of Waipapa point, which is low and projecting, is Waiiau-toa or Big river. The break in the Kaikora and Looker-on ranges

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\* See Admiralty charts, Nos. 2,529, 2,532, 2,533; scale,  $m=0\cdot3$  inches, being sheets 8, 9, 10 (coast of New Zealand), by Captain J. L. Stokes, R.N., and officers of H.M.S. *Acheron*, 1849–5.

† See Admiralty chart, anchorages on east coast, Middle island, No. 2,178,  $m.$  = various.

formed by the valley of this river has the appearance of a harbour from a distant offing: nearly 3 miles south of Big river is a boat harbour and fishery; two white streaks in the wooded cliffs point out the landing place.

**KAIKORA PENINSULA** is a hummocky tongue of land 330 feet high, projecting two miles at right angles from the coast, and lies 20 miles southward of Waipapa point, and 50 miles from cape Campbell. It forms Ingles bay on the north, Gooch bay on the south, and affords shelter to coasting vessels from north-easterly and south-easterly gales.

The Kaikoura township, situated on the shores of Ingles bay, is at present thinly populated, but promises to be a place of some importance in the province of Marlborough, the country adjacent having been taken up by settlers for agricultural purposes, and small farms are now to be seen in a thriving condition on the suburban sections. Provisions of all kinds are easily procured by shipmasters requiring them, and water is plentiful.

**INGLES BAY.\***—That portion of the coast line known as Ingles bay lies between the Hapuku river on the north, and northern point of the Kaikoura peninsula on the south. The usual anchorages are well sheltered from the N.N.W. through W. to south-east with good holding ground, in depths varying from 7 to 10 fathoms, but open to north-east and easterly gales.

With north-easters the sea does not rise to any extent, but with easterly gales it is very heavy, and although partly protected by the peninsula and Lynch reef, nevertheless a heavy sea runs into the bay. Small vessels when seeking shelter from southerly and south-easterly gales should anchor well under Lynch reef in 7 to 9 fathoms, sandy bottom, which enables them to make a good board to the N.N.W. should the wind shift into the north-east quarter.

**Beacons.**—Four beacons have been erected on the cliffs near the sea, as leading marks, two for the outer and two for the inner anchorage. They are painted as follows:—Upper outer anchorage beacon, *black* and white with white perch, and elevated 105 feet above high water. Lower outer anchorage beacon, *red* and white with *red* perch, and elevated 95 feet. Upper inner anchorage beacon, *red*, and elevated 55 feet. Lower inner anchorage beacon, white, and elevated 40 feet.

**Directions.**—Vessels from the northward making for the anchorage may in ordinary weather steer a course direct for mount Eyes, which rises from

\* See Admiralty charts:—New Zealand, No. 1,212; and New Zealand, Middle island, sheet VIII., No. 2,529. Also Anchorages on east coast Middle island, No. 2178, scale m. = various.

The information, relating to Kaikora peninsula, is from the remarks of G. A. Woods, colonial marine surveyor.

the centre of the peninsula, until within about two miles of the shore, when a S.W.  $\frac{1}{4}$  S. course for the outer anchorage beacons on the cliffs under mount Eyes, will lead into a good outer anchorage with 10 and 11 fathoms, dark sand, and within a few hundred yards of the St. Kilda rock, taking care to keep the Nine Pin rock, which lies to the north-west, open northward of the St. Kilda rock.

Vessels approaching the Ingles bay from the south in ordinary weather may steer moderately close to Lynch reef, which lies off Kean point, the eastern extreme of the peninsula, and haul up to a course keeping the Nine Pin rock open northward of the St. Kilda rock, anchoring in any position on that line of bearing.

In bad weather it is necessary to give Lynch reef a wider berth, as a shoal rocky patch of from 5 to 6 fathoms lies N.E. by E.  $\frac{1}{2}$  E.,  $1\frac{1}{2}$  cables from the north-east point of the reef, over which the sea breaks with considerable force in heavy weather from the south, and south-east.

**Fyffe Cove** is a boat harbour about 6 cables to the westward of Lynch reef, formed by Observation point and the projecting reef to the eastward, capable of holding, when properly moored, three or four coasters of a draught of water not exceeding 6 to 8 feet.

**Directions.**—Vessels making for this inner anchorage must keep the outer anchorage beacons in line until the second set of beacons at the head of the cove are in one, when they should immediately haul up on to this new line of bearing, which will carry them into the harbour, clear of a rock awash lying on the eastern side of the entrance. Care must be taken not to go off the line of bearing for Fyffe cove, as a dangerous rock with only 6 feet of water lies between St. Kilda rock and Observation point.

Moorings are laid down to the rocks on both sides of the harbour, enabling vessels to lie moored with their heads to the north, with comparative safety.

A jetty has also been constructed by the Government to allow of small craft hauling alongside to discharge their cargoes.

A passage for vessels bound to Fyffe cove exists between the St. Kilda rock and Observation point, but care must be taken to avoid a sunken rock lying nearly in mid-channel with 6 feet of water at low-water springs.

**Caution.**—Mariners are cautioned against bringing up amongst the kelp, for as a general rule the bottom is rocky and broken and not good holding ground.

**Davidson Rocks**, lying N.W. by N., and distant nearly  $1\frac{1}{2}$  miles from Observation point, is a dangerous and shoal patch awash at low water springs. Between these rocks and the shore, and bearing N.W.  $\frac{1}{2}$  W. from Observation point, is another dangerous patch known as the Ruby shoal, consisting of two conical rocks lying north-west and south-

east of each other, six feet apart, with three feet of water at low water springs.

To avoid these rocks when working in or out of Ingles bay, mariners are cautioned not to open the Nine Pin rock seaward of Kean point, as that line of bearing leads on to the eastern portion of Davidson rocks; they must also bear in mind that the current almost invariably sets to the northward on this portion of the coast, generally running stronger on approaching the shore.

**Bullen Cove**, formed by Baxter reef to the westward and Haul-round point to the eastward, cannot be recommended as a good anchorage on account of the holding ground being bad, and various detached sunken rocks that lie on the south-east side.

**Currents.**—The usual set of the stream at the Kaikoura peninsula is to the northward, varying a point or two according to the direction of the coast line. The velocity is from three quarters to one and a half knots per hour.

On this part of the coast a southerly current of a knot an hour is occasionally experienced after southerly winds have been blowing.

**Tides.**—It is high water full and change at Kaikoura peninsula at 5h.; springs rise 6 feet, neaps 4 feet; but both the velocity of the current and height of the tides are generally influenced by the prevailing winds.

**Winds.**—The fall of the barometer, accompanied by a distinct view with a fine blue tint, of all distant objects, such as the Looker-on and Kaikoura ranges, and remarkable transparency of atmosphere, gives warning of a north-wester. A slight fall in the barometer, with a thick bank of clouds rising to the south-east, rainy weather, and the tops of the hills clothed with a white mist, are considered certain indications of a south-easter, the barometer rising almost immediately after the wind sets in, when it continues to blow violently, with a rising glass; the prevailing winds during the winter are from the north-east. In autumn and spring the winds are variable between north and east, but frequently a north-east swell sets in to Ingles bay without the wind blowing home; this is considered a sure indication of having north-west weather in Cook strait. The finest months are from December to March.

**GOOCH BAY**, situated on the south side of the peninsula, lies between Haul-round point and the Kohai or Waite river. The anchorage in this bay is well sheltered from all winds but those between the south and east, good holding ground being found at a depth of from 8 to 9 fathoms, with the southern extreme of Baxter reef on with Haul-round point bearing E.S.E. In hauling into this anchorage care must be taken to avoid the Cone rock, nearly awash at low water, lying S.W. of the end of Baxter reef, and distant about one quarter of a mile.

Vessels approaching this anchorage from the northward can haul close round the reef off Haul-round point, where they will steer a course towards Bullens Wool-shed, a conspicuous mark on the coast between the Kohai and the Kahutara river until mount Wharton is on with the northern peak of the Looker-on Ranges, when they may haul up for the anchorage clear of the Cone rock.

Between cape Campbell and Kaikora peninsula rise the lofty and snow-clad mountains known as the Kaikora and Looker-on ranges; the former are midway between these two points, and 14 miles from the coast; they are 9,700 feet high, rising in sharp and rugged peaks; the Looker-on range are 13 miles north of the peninsula, and 7 miles inland, of the same character, and 8,700 feet above the sea.

**AMURI BLUFF.**—For 11 miles southward of Kaikora peninsula, is a continuous bight, the south point of which is Amuri bluff; this bight is about 2 miles in depth, and has several outlying rocks nearly one mile from the shore; a reef 6 feet above water lies 2 miles northward of this bluff. Small coasters can moor in safety within these reefs. There is very deep water off Amuri bluff, 184 fathoms having been obtained only 2 miles from the shore.\*

**THE WAIU-UN RIVER** is about 26 miles south of the Kaikoura peninsula. The entrance may be distinguished at a distance by a lofty mountain, mount Caverhill, rising 2,000 feet above the level of the sea, 7 miles to the northward of the entrance. From its summit the Caverhill range extends to the southward, terminating abruptly on the northern banks of the Waiu-un river; the peaks of these ranges are stony and rugged. The Cheviot hills form the southern boundary of the river, and are of a hummocky formation.

The river has frequently two narrow entrances, one immediately at the base of the Cheviot hills and the other about half a mile north of this, on a shingle beach; both entrances are shifting, and the velocity of the stream on the ebb is so rapid as to render it dangerous for boats. A constant fresh is running out of its narrow entrance 60 feet in width, at the rate of 5 knots on the ebb and 2 to 2½ on the flood, rendering it unfit for navigation except with the flat-bottomed steamers, when it must be taken at the last quarter flood. Vessels would, of necessity, have to be secured to the shore within the river, as the bottom is composed of boulder stones, excepting in a lagoon running parallel to the beach on the northern side of the entrance, at the head of which from 8 to 10 feet of water is found at all times, with room for two vessels to be moored.

The shoal banks within the entrance shift with every fresh, making it impossible to give any specified directions to avoid those dangers, and

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\* A shoal bank of 4 fathoms is reported to exist 12 or 15 miles south of Amuri bluff, and 6 or 7 miles off the shore.—Wellington and Canterbury Almanack, 1855.

rendering it absolutely necessary for a pilot to be stationed here, should it be determined to open the navigation of this river.

No outlying dangers exist off the mouth of the Waiau-ua river which can be approached boldly to within half a mile, in a depth of  $4\frac{1}{2}$  to 5 fathoms, but vessels should not anchor in less than 6 fathoms, as the sea breaks some distance from the land in southerly and south-easterly breezes.\*

**GORE BAY.**—Southward of Waiau-ua river is Gore bay, merely a slight indentation in the coast; rocks extend off the shores more than half a mile, nearly to the Hurunui river, which is 9 miles from Waiau-ua river, and with it rises in the Wakarewa and Te-koa mountains, which are between 5,000 and 6,000 feet high, and distant 30 miles inland; the Hurunui river is also only fit for boats.

The country in the neighbourhood of Gore bay, known as the Cheviot hill station, is one of the finest grazing districts in New Zealand; it is all freehold, and from nine hundred to a thousand bales of wool are shipped annually from this station alone, but the difficulties of shipment, on account of the exposed nature of the coast, are very great.

An organised boat establishment of Kanakas, from the Sandwich islands, is maintained here to man the surf-boat. The present landing place is on the sandy beach lying between McClellan point and the Jed river; the beach is very flat, and for one-eighth of a mile to seaward there is not more than a quarter to half a fathom of water, when it suddenly dips to  $1\frac{1}{2}$  and 2 fathoms. With any swell from seaward the sea breaks over this shoal ground with great violence, and in gales from the south-east it has frequently been known to break nearly as far seaward as the general trend of the coast line in 5 fathoms water.

Every convenience for landing is here, a warping-buoy being laid down for hauling the boats in and out through the surf; landing, however, should never be attempted excepting in a whale boat, and as a rule mariners are recommended not to venture in their own boats, but to await the arrival of one of the fine surf-boats from the shore, when they can land with safety under the guidance of an experienced resident boatman. The best landing is to be found in that portion of the bay lying between McClellan point and Gibson point, the south-east point of Gore bay. It is well protected from the southward, and the beach is comparatively steep. A difficulty exists at present with respect to this landing on account of there being no road to the interior, the only means at present being under McClellan point, at low water.

**Anchorage.**—The roadstead is open to all winds between the south-

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\* A shoal, with 4 fathoms on it, has been reported, lying N.E. by E., 5 miles from the mouth of Waiau-ua river.

east and north, and the general shallow nature of the bottom renders it available only for small coasters; the holding ground is good, sand and clay, but in some places foul ground exists below the sand, necessitating a stout crown rope to ensure canting the anchor.

Vessels from the southward making for Gore bay must not approach too near to Gibson point on account of the Chapman and Mid-bay rocks, two dangerous sunken rocks which lie to the northward and north-east of that point, the latter being half a mile from the shore, but must stand on a northerly course until the outer White rock off McClellan point is well open of the Wool-shed on the beach to the northward of it, they may then haul up for a beacon which has been built on the cliffs under Cavern hill. Keeping this in one with the northern gable of a summer-house W.  $\frac{1}{2}$  N., will lead clear of Mid-bay rocks into an anchorage in 4 fathoms within two hundred yards of a warping buoy. There is at all times a swell in the roadstead, and a vessel must be prepared to leave with the first symptoms of a south-easter.

**CURRENTS.**—In the offing strong currents setting to the northward are experienced, often running one and a half knots per hour after south-east gales.

**SAIL ROCK** lies close off a projecting clifly piece of coast 4 miles southward of Hurunui river; 8 miles further to the south-west is Motunau, or the Table island of Cook, which, like Sail rock, has a white appearance in bright weather.

**TABLE ISLAND** (*Motunau*) is small, lying three-quarters of a mile from the shore, and almost connected with it by reefs; there are also reefs extending nearly one mile to the eastward and southward, and a rocky patch, with 4 fathoms, 2 miles S.W. by S. of it. The island affords shelter for boats.

From Table island the coast recedes to the westward, becomes low and sandy, and forms Pegasus bay, the south side of which is Banks peninsula; the shores of this bay form the sea face of the northern portion of the great southern or Canterbury plains.

**PEGASUS BAY** is nearly 40 miles in extent, north to south, and 15 miles in depth; its northern shore, from Table island to Double (or the north-west) Corner, a distance of 12 miles, is clifly, with a sand and stony beach, at low water; 4 miles westward of the island are two shallow patches, extending one mile from the shore; they should be avoided, and are the only dangers in Pegasus bay.

From Double Corner,—where there is good boat landing in fine weather,—a sandy beach extends for 27 miles or nearly to the entrance of port Victoria; five rivers run into the sea along this beach after winding



through the plains; the three northernmost are dry at their entrances at low water, the next is Courtenay river (*Waimakariri*).

**Soundings.**—The depth of water across the entrance of Pegasus bay is 20 fathoms, which shoals gradually in to 6 and 7 fathoms one mile from the sandy beach: this regular change in the soundings, and the distance they extend off this part of the coast in particular, renders the approach to port Victoria easy at night or in thick weather.

**WAIMAKARIRI RIVER.**—The entrance to the Waimakariri river bears from Godley head N.W. by N., distant 12 miles. There is a bar, which is constantly shifting and varying in depth. A signal-staff with semaphore arms, similar to that at Sumner, stands on the highest sand hill immediately to southward of the entrance, and two moveable beacons are placed on the south spit and kept in one as nearly as possible with the deepest water over the bar, which has generally about 3 feet on it at low water spring tides. Vessels of 40 tons can ascend about 8 miles to Kaiapoi; the navigation of the river inside is easy, and the channel well staked.

**AVON RIVER** (*Opawaha*).—The entrance of this river lies at the south extreme of the sandy beach of Pegasus bay, and is only  $2\frac{1}{2}$  miles N.W. of Godley or Cachalot head, the north entrance point of port Victoria; as a means of conveying cargo, between that seaport and the plains, it is of great importance to the Canterbury settlement, and in moderate weather is accessible to vessels drawing from 8 to 10 feet water. The bar is one-sixth of a mile outside the Cave rock and the rocks above water off the southern entrance point; it is 400 feet in width, composed of fine sand, and has a depth in the channel of not less than 5 feet at low-water springs, shoaling gradually from either side.

The entrance of the river lies at first in a southerly direction, and when a quarter of a mile within the bar it bends rather suddenly to the westward; the narrowest part of the channel, which is at the elbow, is 150 feet wide, but on passing it where a vessel would turn, there is a space of 400 feet with not less than 9 feet at low water, and in the channel to the Shag rock 10 to 11 feet.

The river takes its rise in a swamp in the plains, and being unconnected with the mountain ranges is less liable to changes from sudden and rapid streams; the greatest strength of current does not exceed from 5 to 6 knots. The highest water on the bar would be 12 feet at springs, and 9 to 10 at neaps, the range of tide being from 7 to 5 feet.

**Signals.**—On Cave rock at entrance to Avon river stands a signal staff, on which are exhibited the New Zealand General Tidal and Bar Signals, and vessels are piloted in by means of semaphore arms.\* Vessels of 40 tons can enter safely at the proper time of tide, and then ascend the river to the ferry, and smaller craft to the quay within 2 miles of Christchurch. Small

\* See page 13.

steamers now run between Lyttelton and Christchurch ; under favourable circumstances the bar may be crossed in open boats with perfect safety.

By taking advantage of moderate weather, which can always be judged of before leaving port Victoria, the bar may be crossed without risk of loss or damage to cargo in a decked vessel of the draught before mentioned. The greatest difficulty of this river appears to be the getting out, and the danger of being set through the rocks at the entrance, but it is found that by keeping close to the north spit a vessel will be set clear of them, and out into the channel.

**SOUNDINGS between Cape Campbell and Banks Peninsula.**—It will have been observed that from cape Campbell to Banks peninsula, a distance of 130 miles, there is no place of shelter, with the exception of temporary anchorages in fine weather under Kaikora peninsula, and also that there are no dangers along that line of coast, extending more than one mile from the shore, except 12 or 15 miles south of Amuri bluff, where a bank with 4 fathoms on it has been reported 6 or 7 miles from the land. Large vessels, however, are not recommended to approach nearer than 3 miles, at which distance, between cape Campbell and Kaikora peninsula, the depth of water is 30 fathoms, and at the distance of 10 miles from the shore 80 fathoms will be found. Southward of Kaikora peninsula, the water deepens suddenly, and at the distance of 5 miles from the land there is nearly 200 fathoms, while 22 miles farther south abreast of Waiau-ua river, there is only 30 fathoms at the same distance. When in the parallel of Hurunui river, or approaching the northern end of Pegasus bay, the bank of soundings extends 23 miles off the coast, at which distance from 60 to 65 fathoms, fine grey sand, will be found.

**TIDES AND CURRENTS.**—The flood tide sets to the northward, the ebb to the southward, at the rate of nearly one knot an hour on this part of the coast, independently of which a northerly set will generally be experienced ; but occasionally after southerly winds it has been found to run in the opposite direction.

**BANKS PENINSULA.**—This singular projection contains, with the exception of Otago, the only harbours on the eastern side of the Middle island. Until a recent period, it was laid down on the charts as a peninsula connected with the mainland by a low and narrow neck only ; it is, however, in reality a mass of rugged and in parts densely wooded mountains, generally about 2,000 feet high, falling rapidly to the plains from which the promontory projects, and bounded by a coast line which is exceedingly broken, and indented with numerous bays and coves. It extends from the mainland in an easterly direction 20 miles, and maintains an uniform breadth of 17 miles ; on its southern side is the Waihora lake, an extensive but shallow sheet of water, which washes the base of the

mountains to their junction with the plains, a distance of 8 miles; this lake is only separated from the sea by a strip of low shingle, scarcely half a mile wide.

From the remarkable appearance of this apparently isolated land, there is no possibility of a vessel mistaking her position; and the navigator will derive considerable confidence in approaching at night, as the bank of soundings extends 25 miles from the coast, a feature almost peculiar to this part of New Zealand.

The principal harbours are, port Lyttelton or Victoria; Akaroa harbour, there are also Levy, and Pigeon bays, snug anchorages; besides several smaller ones, which, though exposed for ships, offer shelter for boats passing from one harbour to another, or for those employed in the shore whaling establishments.

\* **PORT LYTTTELTON or VICTORIA** (*Tewhaka*) lies on the north-west side of Banks peninsula, having a common entrance with port Levy, the entrance being  $2\frac{1}{2}$  miles from the south end of the sandy beach of Pegasus

\* Formerly known as port Cooper. See Admiralty chart of Lyttelton or Victoria, Levy, Pigeon or Wakaroa, and Erskine bays, No. 1,999; scale, *mile* = 1.6 inches, by Captain Stokes, R.N., 1849.

The following extract from a letter written in 1855 by Mr. J. W. Hamilton, Collector of Customs at port Victoria, is a valuable addition to our knowledge of this harbour:

“The harbour has proved, as regards all winds from seaward, perfectly safe; the severest and most trying gales blow down the harbour from S.W., and though with only a fetch of four miles, and a portion of that over shoal ground, it sends quite a heavy sea on the beach at Lyttelton, on which two vessels have been wrecked from anchoring within the points of the bay, where the holding is not good.”

From the report of the Lyttelton Harbour Commission in 1863, it appears that in summer, when the north-east winds prevail, a considerable swell rolls in from seaward. From the foregoing considerations, it has recommended the construction of a breakwater and wharf from Officers point, to take a south-westerly direction for 700 yards; curving the head of the breakwater to the westward to give partial protection from the sea, which gets up during the fiery south-west gales. The Commission has also recommended for immediate extension the government jetty, 130 yards, for convenience of discharging cargoes, with proposal for a further extension, which, with the breakwater from Officers point, will effectually give secure protection from all winds and weather.

As the progress of the province of Canterbury has been demonstrated in the increasing value of the imports and exports (the imports alone being in one year an increase of 278,221*l.*), the above suggestions for the improvement of the port will probably be accomplished.

The Commission has also recommended the following, bearing on the navigation of the port:—

As the headlands near the entrance of port Victoria, when capped by fog, or in thick weather, or when the light is very dim, become so much alike in outline, colour, and general appearance, some leading landmark is greatly required, and therefore it has been suggested that a distinctive mark be painted on the face of Godley head. It should be at the height of 50 feet above high water it would then be always visible below the

bay ; it is 2 miles wide between Godley head on the north-west and Baleine point on the south-east ; and runs in a S.W. by W. direction 7 miles. Toloa or Adderly head, between the harbours, lies back from the other two. The town of Lyttelton is situated on the north shore in a small bay, 4 miles from the heads ; above it there is only sufficient depth of water for small coasters.

Since 1851 the size of square rigged vessels frequenting the port of Lyttelton has increased from an average of 500 tons register, drawing 14 feet water, to 1,500 tons register, drawing 18 to 20 feet ; when laden the largest vessel entered drew 18 feet water and was 2,340 tons register.

**GODLEY HEAD and LIGHT.**—Godley head is a perpendicular volcanic cliff of a dark red colour on which stands the lighthouse painted white. It is a *fixed* white light, 440 feet above the level of the sea, seen between the bearings of W.  $\frac{1}{4}$  N., round by west and south to S.S.E.  $\frac{1}{4}$  E., or through an arc of 200° ; visible in clear weather 30 miles. The tower is 30 feet high. From the great altitude of Godley head light, it may be expected that it will be often obscured by fog.

**Pilot.**—At the foot of the western side of Adderly head, in little port Cooper bay, stands the pilot station. A look-out is kept day and night ; and vessels requiring a pilot after dark should, when between the heads, burn a blue light or show a flare up, and the signal will be promptly answered by the pilot, unless engaged with another vessel, in which case a ship may with safety proceed up the fairway of the harbour and anchor below the shipping in five fathoms. The harbour pilot will shift her at daylight to a proper anchorage.

In approaching the harbour from the northward, mount Herbert, the highest peak of the peninsula, is a prominent mark, port Lyttelton lying to westward of it.

On a nearer approach, mount Pleasant, the highest peak on the north side of the harbour, is easily distinguished, being bluff towards the port and sloping off gradually to the lowland of the plain.

Coopers knobs, at the head of the harbour, are remarkably round, wooded, overhanging peaks, and form a leading mark for steering up the harbour, with the house on Quail island under them bearing S.W. by W.

Vessels from the southward after rounding the peninsula, should keep along the land, about one mile and a half off, until they open out ports Lyttelton and Levy.

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line of fogs, which hang within 135 feet of the sea, and which would obscure any beacon erected on the summit of the headland.

It is strongly urged to lay down in the roadstead and fairway for large ships, a sufficient number of heavy substantial screw moorings with large and conspicuous buoys and for coasting traders an ample supply of such screw moorings in Erskine bay with buoys.

There is good anchorage outside in calm or southerly weather, soundings from 7 to 10 fathoms 4 or 5 miles from the shore.

The entrance to the port is one mile wide, and it maintains the same width as far as the anchorage off Lyttelton. The course up port Lyttelton is S.W. by W.  $\frac{1}{2}$  W.; the entrance heads are bold and steep-to, and have 8 fathoms between them, which depth decreases gradually to  $3\frac{1}{2}$  fathoms at the anchorage; there are no dangers on either side in working up, with the exception of the Parson rock, a small detached pinnacle rock with 8 feet on it at low water: this rock lies in a N.N.W. direction from Ripa islet, (near the south shore,  $2\frac{3}{4}$  miles within the heads,) and is  $1\frac{1}{2}$  cables from the shore. A small *red* buoy has been placed on an outlying detached rock of 14 feet, about 30 yards outside the 8-foot rock.

Port Victoria is easy of access in most weathers, except in south-west gales, which draw out with great violence. It is somewhat open to easterly winds, but gales from that quarter are not of frequent occurrence, north-east and south-west being the prevailing winds. With strong northerly winds a considerable swell rolls into the harbour.

The harbour authorities assert that as the bottom for the greater part is composed of soft mud, it has been proved to be safer for vessels to lie at single anchor with a long scope of cable (60 or 70 fathoms), with the second anchor ready, than moored.

**Tides.**—It is high water, full and change, at port Lyttelton, at 4h. 20m.; springs rise  $7\frac{1}{2}$  feet, neaps 4 feet. The tides are greatly affected by the wind.

Immediately within Toloa head, the south entrance point, there is a small bay, named little port Cooper, which whale ships formerly frequented for water, &c.; but it is open to northerly winds. Three miles further up, on the same side, is a deep cove, which is too shallow for anything but boats.

**Quail island**, connected at low water with the mainland, also lies on the southern side of the port, opposite Lyttelton, and  $1\frac{1}{2}$  miles distant from it.

**Anchorage.\***—Midway between Quail island and the town the Shag reef will be seen; vessels of large tonnage should anchor fully three-quarters of a mile outside this reef, with the eastern point of Erskine

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\* During the stay of H.M.S. *Challenger* at this port in 1869, strong sea-breezes were experienced, which sent in a heavy uncomfortable swell. The holding ground, although mud, is of such a treacley consistency, that during strong breezes ships nearly always drag their anchors, slowly but surely, through it. The *Challenger* dragged nearly a cable in 36 hours, with 50 fathoms of chain out and a clear anchor; while merchant ships dragged much further. I feel convinced that no vessel would hold in this port during a strong north-east gale; the sea would then break in 5 fathoms.—From Remarks Nav. Lieut. H. Y. Slader, *H.M.S. Challenger*, 1869.

bay,—in which the town stands,—in a line with the Custom house bearing N.N.W.  $\frac{3}{4}$  W.; this berth will be in  $3\frac{1}{2}$  fathoms at low water, with good holding ground, muddy sand, and at a distance of little more than half a mile from the jetty. The eastern or outer end of the town should not be opened out.

Small vessels, for the convenience of loading or discharging cargo, may anchor in 15 feet abreast the Custom house, a quarter of a mile from the shore. The depth of water at the jetties is uniform, gradually increasing from the Screw pile, towards Woods and Cunningham's wharf, and vessels under 15 feet draught of water can moor alongside and discharge direct into the railway trucks.

**Breakwater.**—A breakwater has been thrown out off Officer point, which affords shelter for small vessels.

**Water.**—Fresh water is brought from Christchurch by rail, and consequently is expensive, being from 6s. to 7s. per ton.

**PORT LEVY, or LEVY BAY\*** (*Koko-rarata*), is close to the eastward of port Lyttleton, the south head of the latter (Toloo) forming its western entrance point; the port runs in a due south direction for little more than 3 miles, and is three-quarters of a mile wide at the entrance, narrowing gradually within; it is free from dangers, with the exception of some straggling rocks which extend about half a cable off its western shores, and which in working in must be avoided. The soundings decrease from 8 fathoms at the entrance to  $3\frac{1}{2}$  fathoms  $1\frac{1}{2}$  miles within, where a vessel should anchor; the holding ground is good, but the port is open to northerly winds; whale ships, however, which in the early settlement of the colony used to frequent both this port and Pigeon bay, have ridden out a whole winter's gales in them. The upper part of the harbour is shallow, and only fit for small coasters.

**Toloo Head** is bold and perpendicular. Baleine point, the eastern entrance point, is rocky, but not high, and has a rock above water extending about half a cable off it; there is also a rock lying off the point, a quarter of a mile further to the eastward, between which and the shore there is a boat passage. A detached conical rock, with a sunken rock a short distance outside it, lies  $1\frac{1}{2}$  cables off shore one mile to the south-eastward of Baleine point.

**PIGEON BAY** (*Wakaroo*), which is very similar in feature to port Levy,

\* See Admiralty chart, Lyttleton or Victoria. Levy. Pigeon and Erskine bays. No. 1,999; scale,  $m=1\cdot6$ .

† The Lyttleton Harbour Commission has recommended on port Levy rocks, which are an outlying danger, and in a fog very difficult to distinguish from some outlying rocks about a mile to the eastward, to be at once erected a basket beacon of iron painted white.

and situated  $2\frac{1}{4}$  miles to the south-east of it, runs in a parallel direction for nearly 4 miles, being separated from it by a ridge of hills between 1,500 and 2,000 feet high. It is equally easy of access, but the deep water runs farther up, as vessels may anchor in  $3\frac{1}{2}$  fathoms,  $2\frac{1}{2}$  miles within the entrance.

Sinclair's farm is in a bay in the south-west corner of the port, and 12 feet will be found half a mile off it at low water.  $1\frac{3}{4}$  miles from the entrance on the western side of the harbour is a deep ravine, with a good stream of water, and anchorage off it in  $5\frac{1}{2}$  fathoms, with good holding ground. The eastern entrance point, Wakarua, has some rocks lying nearly a cable off it, and a sunken rock has been reported to exist, lying from  $1\frac{1}{2}$  to 2 cables due north of Pigeon point, the western entrance head, but otherwise it is entirely free from dangers. This port was formerly a favourite resort of whale ships.

Between Pigeon bay and the eastern extreme of Banks peninsula, a distance of 15 miles, there are several small bays and bights, the principal of which are Akaloa, Oken, and Bone bays; they are each little more than one mile in depth, and about half a mile in width; the coast between them is steep and iron bound.

**Akaloa** is a double bay, rocks extending from the middle head to the north-west, almost close the western portion. The eastern bay runs in a southerly direction nearly two miles, and is narrow, but has four fathoms one mile within. The eastern head is a remarkable steep and projecting point.

**Longlookout point** is the western point of Akaloa bay. In September 1863 the ship *Catherine* is said to have struck on what was supposed to be a pinnacle rock lying three-quarters of a mile off the north-east extreme of Longlookout point, or half a mile outside the rocky patches marked on the Admiralty chart.

**Caution.**—Vessels are cautioned, until the dangers off this salient point of the coast are farther examined, to give it a berth of at least one mile in passing.

**CURRENT.**—There is a constant current setting to the northward off the peninsula, varying in strength according to the wind.

**THE SAIL ROCKS** are a detached cluster standing a third of a mile off the coast near the east point of Oken bay; in their immediate vicinity the coast line becomes low, which adds to their sail-like appearance when seen as an extreme of the land.

**BONE BAY** is nearly at the eastern extreme of Banks peninsula, being two miles north of East head. It runs in a west direction, and has anchorage nearly one mile within the entrance in 4 fathoms; the south entrance point, being a perpendicular cliff from 300 to 400 feet high, is appropriately named Steep head. Neither of these bays can be considered

as eligible for anything but small vessels, and they are exposed to easterly and north-east winds.

From Putakolo head, which is high cliffy, and one mile south of East head, the coast rounds away to the southward and westward, and, like that to the northward, is much broken and indented.

**Soundings.**—The depth of water one mile off shore, from port Lyttelton or Victoria to Bone bay, is from 9 to 10 fathoms, sand bottom; to the southward the soundings increase to 12 and 20 fathoms at the same distance.

**Pompey's Pillar.**—On the southern side of the peninsula, 11 miles from East head, is the entrance to Akaroa harbour: the intermediate coast is rocky and indented, with numerous narrow but deep bays; the projecting points are cliffy with straggling rocks near; among the latter, 5 miles E.N.E. from Akaroa, is a remarkable columnar rock, known as Pompey's pillar.

**AKAROA HARBOUR\*** penetrates Banks peninsula in a northerly direction more than 8 miles, its inner part approaching within 4 miles of the head of Pigeon bay; it is a magnificent port, affording secure and land-locked anchorage to any number of vessels, and is easy of access in moderate weather.

**Caution.**—During strong south-west winds there is a heavy cross sea at the entrance, with violent baffling squalls caused by the high precipitous nature of the shores; at such times entering with a sailing vessel is attended with some degree of danger.

The heads are bold and steep; off Trueni point (the eastern), at a distance of 2 cables from the shore, lies Boat rock, a black rock, 20 feet high, having the appearance of a boat from a distance.

**Iron head** (*Timatim*), the western entrance point, is a high perpendicular cliff, of a dark grey colour; detached rocks 15 feet high extend to the southward of it, and others outside them, on which the sea breaks, extend nearly 3 cables from the shore.

**Wright rock.**—The Wright rock lies S. by W. about half a mile from the south head of Akaroa harbour; it is pinnacle-shaped, and has about 11 feet water over it at low water, and only breaks in a heavy sea. No kelp marks the locality.

The entrance is nearly one mile in breadth, and continues so to Cavern head, a steep cliff on the eastern shore,  $1\frac{1}{2}$  miles within; here it is somewhat less in breadth, but immediately afterwards increases to  $1\frac{1}{4}$  miles, which it carries to the anchorage in Pakaeriki bay, on the eastern shore nearly 6 miles from the heads. The course is N.W. by N. at first, and then the harbour trends nearly N. by W.

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\* See Admiralty plan of Akaroa harbour, No. 1,575; scale, *mile* = 2.5 inches.



Vessels should not anchor until above Nine-fathom point, which is  $2\frac{1}{2}$  miles inside the heads; outside this there is generally a swell, the depth from 14 to 10 fathoms, and the holding ground not good; above this point the depth decreases gradually from 9 to 6 fathoms, and in Pakaeriki bay there is excellent anchorage, in 4 fathoms at low water, little more than half a mile off the settlement.\* A reef of rocks, awash at high water, extends little more than a cable off Observation head, the south or outer point of this bay, off the extremity of which a *white buoy* has been placed; otherwise there are no dangers.

This place is now principally used as a watering place for Christchurch; the surrounding districts are well settled by farmers employed in daily pursuits.

There is an extensive sheet of water above Pakaeriki bay, with good anchorage in every part in not less than 3 fathoms at low water; a remarkable peninsula projects from the head of the harbour three-quarters of a mile in a southerly direction, connected by a long narrow neck.

**Onouai bay**, to the westward of the peninsula, is shallow within Massacre head, but the three bays to the eastward are available for vessels of 12 or 14 feet at low water. A road extends from this head of Akaroa harbour to port Lyttleton.

**Wood and water** are to be obtained in abundance at Akaroa; there are streams running into all the bays.

**Tide.**—It is high water, full and change, in Akaroa harbour at 3h. 24m.; springs rise 8, and neaps 6 feet; its influence is very little felt in the harbour.

The winds generally draw either up or down, and vessels should not attempt to leave with a strong southerly wind.

**Soundings.**—A bank of soundings, with anchorage in 10 fathoms, is reported as lying from two to three leagues off Akaroa heads.

**From AKAROA to the WESTWARD.**—Leaving Akaroa harbour the coast takes a westerly direction, and at the distance of 7 miles its cliffy outline is broken by Peraki cove, which is similar in character to the small bays on the northern side of the peninsula; it is a snug anchorage with off-shore winds; a single whale ship, carefully secured, has ridden out a winter's southerly gales in it; these gales are not unusual, and blow with great violence.

Three miles westward of Peraki, completes the circuit of this singular

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\* It was here that a few French agriculturists established themselves in 1840 under the auspices of the Nantes-Bordelaise Company, a small French association; the original settlers have since decreased in numbers, but, a few English and Germans have joined the settlement. A resident police magistrate is stationed here.

promontory, and its rugged and imposing coast line is succeeded by a low cliffy and shingle shore, 70 miles in extent.

**The NINETY-MILES BEACH.**—to preserve the name given to this line of coast since it was first visited by Europeans,—commences, as has been observed, from the south-west extreme of Banks peninsula; for the first 5 miles it is a narrow strip of shingle beach scarcely half a mile wide, forming the sea boundary of Wahiora lake; at its southern end it communicates with the sea through a narrow opening in the shingle; this, however, is closed for a great part of the year; from hence the coast trends S.W. 55 miles, and is composed of low cliffs from 20 to 40 feet high, fronted with a shingle beach.

Several rivers struggle their way to the sea through this beach after traversing the plains from the base of the hills 25 miles inland; these rivers are only available for boats, and their depth and velocity vary according to the seasons.

**TIMARU and ROADSTEAD.**—At the extreme of the Ninety-miles beach a rocky projection from the coast occurs named Timaru, one and a half miles north-west of Patiti point, the site formerly of an old whaling station, but now appropriated as a reserve for a township for the adjacent extensive pastoral district, which latter is becoming rapidly occupied: the mountain ranges approach here near the coast, and instead of the low level country existing farther north, the land consists of grassy slopes, ascending gradually to the higher ranges. Seven miles northward of Timaru two isolated clumps of trees will be seen a little more than 3 miles inland; the Wanganui river runs between them, and they are remarkable as being the first wood seen on the coast south of Banks peninsula.

The coast line from Banks peninsula to Timaru is low, and cannot be seen in thick weather or by night, until close in with the breakers, while to the southward of the town of Timaru, the cliffs are from 30 to 50 feet high; this is a sure guide to Timaru, viz., low shingle beach to the northward: moderately high cliff to the southward.\*

A vessel can safely stand off and on, this part of the coast by keeping outside a depth of 7 fathoms.

If the weather is clear the high mountain range will be seen behind Timaru long before the coast line has risen; and Burke's pass, a remarkable gorge almost directly behind Timaru, is a good landmark, showing a distinct gap: there is a small town a short distance to the north of and in sight of Timaru, but the cliffs before mentioned will prevent any mistake.

**Directions.**—Vessels bound for Timaru, after rounding Banks peninsula, should steer S.W. by W. southerly, unless the wind be strong from E.S.E.,

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\* From the authority of Captain F. E. Gibson, Chief Harbour Master of the province of Canterbury.

which causes an inset, when it is necessary to keep three quarters of a point more southerly.

A flag-staff and storehouse point out the landing place—which is said to be good—on the open beach at Timaru; from thence a rocky line of coast extends a long mile S.S.E. to the projecting Patiti point: this shore is fronted by sands and shoal patches, with outlying reefs of rock and kelp always breaking, the reefs extending nearly two-thirds of a mile direct to seaward from Patiti point, and one and a half miles to the south-east from the storehouse at Timaru.

**LIGHT.**—There is a *red* light shown at the harbour-master's office on the cliff above the Government landing shed, visible from three to four miles; if made by night bring it to bear W.S.W., and run in on that bearing, anchoring in not less than  $4\frac{1}{2}$  fathoms.

**Anchorage.**—The roadstead of Timaru was surveyed in 1858 by Lieutenant Woolcombe, R.N., who proposed berths for fixed moorings on the under-mentioned bearings. For a ship of 1,000 tons, the storehouse at Timaru, bearing W. by N., about one mile distant, and the extreme of Patiti point, S. by W. in  $6\frac{1}{4}$  fathoms, fine sand; and for small vessels the storehouse bearing S.W.  $\frac{3}{4}$  S., about half a mile distant, and Patiti point S. by E.  $\frac{1}{4}$  E., in  $4\frac{1}{2}$  fathoms, fine gray sand; both these berths are within half a mile of the outlying reefs.

**SIGNALS.**—In addition to the general signals for the colony, published in the "New Zealand Harbour Regulations,"\* the following local signals are used as required:—

A ball at one yard arm, and one on mast, half the length of the yard below the yard	} Wait till the tide ebbs.
A ball at each yard arm	- - - { Vessel may stand in safety.
Two balls at each yard arm, one below the other	- - - { Vessel may stand in safety; a boat will put off.
Two balls at one yard arm (one below the other) and one ball at the other yard arm	- - - } Anchorage not safe, keep to sea.

When vessels at anchor should put to sea, the general signal "Put to sea" will be shown.

No. 2 Marryatt's Code over second distinguishing pennant at mast head: The vessel is running into danger.

**Night Signals.**—The night signals are as published in the New Zealand Harbour Regulations; but when it is intended that vessels at anchor

\* See page 13.

should put to sea, two guns will be fired in addition to showing the proper lights.

**CAUTION.**—Ship's boats should never be used for landing, as the amount of surf on the beach cannot be judged from seaward.

In bad weather a look-out is kept on shore. By night, should a vessel part or be in danger of dragging on shore, (as a last resource) slip and run her on the beach as near Le Crens gully (to the north of the town) as possible; let the hands remain by the wreck, and assistance will be given by means of a rocket fired over the vessel.

From Patiti point to the southward the coast line is again formed of low cliffs fronted by shingle beach, and extends 30 miles in a south direction to Waitangi river, with several small streams intervening. A high mountain range (3,500 feet), known as the Hunters hills, approach within a few miles of the coast between Timaru and Waitangi river.

**WAITANGI RIVER** is a very considerable stream, flowing through a plain of some extent in a west direction, though only 10 or 12 miles in width; its entrance may be known by the low tongue of land it appears to have thrown out from the hills near. It is fed by the numerous lakes and mountain ranges in the interior, and the velocity in summer, during the melting of the snows, is so rapid as to render it unfit even for boats to enter. This river may be said to form a natural boundary between the Canterbury and Otago settlements.

**The COAST.**—From Waitangi river the coast trends S.S.W. for 25 miles, to the Look-out bluff. The low cliffy coast with shingle beach continues for 15 miles, or as far as the cape Wanbrow, a protecting bluff of moderate height, from thence it assumes a different aspect, being broken into sandy or shingle bays, with cliffy points between.

**OAMARU Anchorage.**—Close to the northward of cape Wanbrow is Oamaru, a safe anchorage with all winds excepting those between N.N.E. to S.S.E.; the anchorage is about two thirds of a mile to the westward of the bluff head land to southward of the town, in a convenient depth of water, about half a mile from the shore.

Heavy moorings have been laid down for large vessels; coasters use their own ground tackle; there are two well-conducted boat establishments at this place.\*

**LIGHT.**—A red light, visible 5 miles in clear weather, is shown at the landing place from sunset to sunrise.

For nearly 30 miles southward of the river, and extending for the most part as far inland, the country is a rich grazing district.

**MOERANGI BAY.**—Look-out bluff (*Awa-Mokihi*) is the north point of this bay, Whalers Home point being its southern extreme. The bay is

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\* From remarks by Staff Commander W. H. Sharp, H.M.S. *Liverpool*, 1870.

5 miles in length north and south, and about 2 miles in depth, the coast line being fronted with a sandy beach; a reef nearly 3 miles long, covered with kelp, extends nearly across its entrance from north to south: this reef is  $1\frac{1}{2}$  miles distant from the sandy beach, and is a great protection to the bay, affording smooth water and a safe refuge inside it for the boats of a whaling establishment situated at its southern end; there is also anchorage for coasters, though it would not be prudent to remain with any symptoms of bad weather from the eastward.

**Whalers Home point** is the eastern extreme of a cliffy projection, and is nearly 3 miles in length, with sandy coves on its north and south sides. These coves form good boat harbours. A small islet (White islet) and some scattered rocks, under water, covered with kelp, lie half a mile off the northern part of this projection; and  $1\frac{3}{4}$  miles eastward of its southern extreme is the Fish reef, which extends in a north-west and south-east direction for one mile, and uncovers at low water, being well marked at other times of tide by kelp; this reef has deep water close outside it.

There are several houses on the summit of Whalers Home point, occupied by whaling people, who have much land under cultivation.

From Moerangai bay southward the country is hilly, and wooded close to the coast; a sandy bay extending for 5 miles, the south extreme of which is Vulcan point. Shoal water extends 2 miles south of this point, at the extreme of which is Danger reef, a sunken rock, whose position is also marked by kelp. Three very remarkable mountain cones rise just to the southward of Vulcan point, 2 or 3 miles from the coast.

**WAIKOUAITI BAY\*** is 17 miles southward of Whalers Home point, and 10 miles north of port Chalmers. It has a clean sandy beach of 2 miles in extent, its southern point being formed by Mistaken islet, close to the northward of which is the entrance of a small river. There is anchorage in the bay with off-shore winds; 5 fathoms will be found within half a mile of the shore.

**Ahuriri rock** lies about three-quarters of a mile from the shore, and 2 miles northward of Jones head, the north point of Waikouaiti bay; it has 5 feet water on it at low water, with 2 to 4 fathoms immediately round. From it Remarkable cliff, near Tairoa head, bears S. by E.  $\frac{3}{4}$  E., Vulcan point N. by E., and Harris bluff S.S.W.  $\frac{1}{4}$  W.

**Caution.**—Vessels should not approach this part of the coast between Vulcan point and Jones head within  $2\frac{1}{2}$  miles, as it has not been examined near the shore, and is considered foul.

**BLUE SKIN BAY**, between Waikouaiti and port Chalmers, is nearly

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\* Mr. Jones, a colonist from Sydney, and who was largely connected with the coast whaling establishments throughout the Middle island, carried on a farming and fishing business here for many years, and small vessels frequented it to embark cargoes (1850).

5 miles in depth; some rocks, which show, extend off its northern shores for about half a mile; otherwise it is clear of dangers, and has a general depth of from 7 to 10 fathoms. There are several sandy bights on its southern sides, which afford good anchorage in southerly off-shore winds.

**SOUNDINGS OFF THE COAST.**—A general description having now been given of the coast between Banks peninsula and port Chalmers, a distance of 150 miles, a reference to the chart will show that for 120 miles of the distance, or as far as Moerangi bay, it is free from danger to within 2 miles of the shore, but that Timaru roadstead should be approached with caution. The bank of soundings is also well defined; and knowing the latitude, a ship's position on approaching the land may be determined with tolerable accuracy. From 50 to 60 fathoms sand will be found 30 miles from the coast, and about 30 fathoms at half that distance, which soundings decrease gradually to 10 fathoms at 3 miles from the shore, where the bottom is chiefly gravel and stones. Between Moerangi bay and port Chalmers the only dangers are the Kelp reef (which lies across the entrance of Moerangi bay), Fish and Danger reefs, and Ahuriri rock; all these reefs excepting Ahuriri rock are either visible, or their positions marked by kelp, and do not extend more than 2 miles from the coast.

Southward of Moerangi bay the deep water approaches nearer to the coast; at the distance of 20 miles there is 60 fathoms, sand and coral, and at 30 miles no bottom was found with 400 fathoms line; at 2 miles from the coast there is from 15 to 18 fathoms. Immediately eastward of port Chalmers the 100 fathom line of sounding does not extend more than 12 miles from the land, and inside that distance it shoals rather rapidly to 30 fathoms; 14 fathoms will be obtained within 2 miles of the entrance.

**PORT CHALMERS or OTAGO HARBOUR.\***—The approach to this port from the southward is well denoted by cape Saunders and its remarkable insulated mountain, 1,410 feet high; from the northward and eastward it will be known by the gap its entrance makes in the land, as also in hazy weather, by a remarkable bank of dazzling white sand heaped at the base of the steep cliffs forming its western entrance head. This bank of sand from a distant offing is frequently mistaken for breakers on the bar. Cape Saunders is marked by a beacon.

As port Chalmers is a barred harbour, there are times when it would be imprudent and unsafe to attempt to enter; to denote the state of the bar the New Zealand general harbour code of signals has been established,†

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\* See Admiralty plan of port Chalmers, No. 2,411, by Captain J. L. Stokes, R.N., 1858; scale  $m=2\cdot0$  in.

Port Chalmers is now the proper designation of this harbour, Otago being the general name of the province.

† For New Zealand General Harbour Signals, see page 18.

which are exhibited from Tairoa head, under the care of the pilots, whose boat's crew are stationed here, and at all times ready to push out when the bar is passable.

The entrance to the port lies north and south. Tairoa, its eastern head, is a bold dome-shaped rocky headland, 244 feet high. From this head the bar extends in a north-westerly direction towards Hayward point, which is the northern extreme of a bluff precipitous headland, forming the western entrance head of the port.

**LIGHT.**—A light is exhibited from a lighthouse standing on Tairoa head, at the east side of entrance to port Chalmers. The light is a *fixed red* light, visible from seaward when bearing from W.  $\frac{3}{4}$  S. round by south to S.E.; and up the harbour when bearing from E.  $\frac{1}{2}$  N. to N.E.  $\frac{1}{4}$  E. It is elevated about 196 feet above the mean level of the sea, and in clear weather should be seen at a distance of 20 miles. The tower is 39 feet high from base to vane, and is white.

Within the entrance a spacious sheet of water extends to the south-westward for a distance of 11 miles, and at the head of this arm of the sea stands the town of Dunedin. Seven miles within the heads a prominent headland, with two adjacent and lofty islands extending across the harbour, form a natural division; above which, the channels leading to Dunedin become either too shoal or too narrow for large vessels prudently to proceed farther. A mile eastward of these midway islands the port town of Chalmers has been placed at the head of Koputai bay, where there is good anchorage for large vessels in 5 fathoms; here they discharge cargo, which is conveyed in boats to Dunedin.

On a reference to the plan of this harbour it will be observed that, when within the bar, the ship channel leading to Koputai bay is deep but narrow, extensive sand banks filling up the central space of both divisions of the harbour.\* This channel is marked by a series of temporary beacons and buoys; but as a stranger should not proceed without a pilot beyond the first anchorage within the entrance, the directions here given will not enter into detail beyond that limit.

**The BAR** extends one mile in a north-west direction from Tairoa head; it is composed of hard white sand, and is in parts an extremely narrow ridge, difficult to touch upon with the lead, with a fathom deeper water on either side; the depth of water on it varies, being a little deeper after the winter gales (July and August), which blow from south-west; and is considered by those locally acquainted with it to be gradually shoaling.

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\* We found changes had taken place in the depths of the channel since H.M.S. *Acheron's* survey (1850), and about port Chalmers (Koputai bay) it had shoaled to some extent.—Commander Drury, in N. Z. Government Gazette, July 5, 1855.

The channel across the bar having gradually regained the deeper water it had before the great tidal wave of August 1868 caused it to shoal, the guide beacons have been shifted, and two white beacons are now (1871) erected on the sandspit extending from the western shore of the harbour.

The harbour should not be approached in a south-east gale, for these winds set the heaviest sea in on the coast, and produce a frightful surf on the bar, which breaks in 5 and 6 fathoms; neither should the bar be attempted on the ebb tide, unless with a commanding breeze, as it sets strongly towards Hayward point. Light south-easterly winds also, which are generally accompanied by a light sea fog, cause a troubled swell on the bar, which is not the case with those from north-east, to which quarter it is more exposed. A strong north-east wind with the ebb tide makes a broken bar, dangerous for boats, but the swell goes down at all times very quickly, particularly with westerly winds.

Vessels anchoring outside the bar to await the tide should not come within 9 fathoms. By bringing the flagstaff on Tairoa head to bear South, a little more than half a mile from the head, the marks will be on for crossing the bar.

**Directions.**—In the event of it being necessary to run in, and the state of the bar such as to prevent the pilot crossing it, the following directions should be observed:—The marks for crossing the bar lead  $2\frac{1}{4}$  cables outside Tairoa head. They are the two white beacons on the sandspit, extending from the western shore of the harbour, brought in line, and bearing S.S.W., which will lead over the bar in 18 feet low water springs, and when a red and white beacon at the Pilot station opens of Howlett point, a course may be steered for Harrington point, passing between it and the sandspit.

Harrington point, the first rocky point half a mile within Tairoa head, may be passed at half a cable, being quite steep-to; the width between it and the low dry spit of sand on the opposite shore, being scarcely 2 cables. A course may then be shaped for the first buoys which are laid down in an inner sand flat leading to the ship channel for Koputai bay, anchoring one or two cables to the northward, or midway between them and Harrington point, in 5 to 8 fathoms. The channel across the inner bar ( $1\frac{1}{2}$  miles within Harrington point) shifts occasionally, but on every change the buoys are altered so as to denote the two-fathom edge, the depth in the middle of the channel being 15 feet. At the present time, 1871, vessels drawing 12 feet can reach Dunedin jetty, and improvements of the channel by dredging operations are still in progress.

**North channel.**—It must be observed that in smooth water, with a commanding breeze, there is an available channel within the bar, between it and Hayward point, with from 22 to 25 feet water. Vessels intending



to take it should bring the entrance of the harbour between Harrington point and the low sandspit opposite it, open on, a S.E.  $\frac{1}{2}$  S. bearing, and sail in on this course. When the signal staff bears E.S.E., they should haul up midway between it and Harrington point, until in the deep channel in 6 fathoms, and then proceed as before directed. The least water at present (February 1871), in the North or main channel is 22 feet at low-water springs, no change having taken place since May 1870. In taking this channel vessels are generally exposed to the swell abeam.

**Driver rock.**—The only danger outside the line of bar is this rock (named after the pilot), with 7 feet at low water; it lies N.E.,  $1\frac{1}{2}$  cables from the north-east extreme of Tairoa head, and is out of the track of vessels crossing the bar, but dangerous for small vessels hugging Tairoa head on that bearing.

From information derived from the pilot, it is considered that the bar is impracticable for shipping about forty days in the year, and that during the winter months it occasionally has continued so for a fortnight consecutively.

**TIDES.**—It is high water full and change at Tairoa head at 2h. 50m.; in Koputai bay at 3h. 30m.; and at Dunedin at 4h. 30m. The mean rise at high water at the heads is 4 feet 9 inches, which will give in ordinary tides, in the North or main channel, a depth of 26 feet 9 inches, being sufficient for vessels drawing 22 feet to enter, except when a south-east sea sets in on the coast, which rarely occurs. With northerly winds and fine weather there is little flood stream, with a rise not exceeding 2 feet. The greatest strength of the tide is in the narrow passage abreast Harrington point, where the ebb runs from 2 to 3 knots, and the flood somewhat less; on the bar the greatest rate is 2 knots. The rise at Dunedin is from 2 to 4 feet.

There is very little interval of slack water at the entrance of the harbour. The flood runs 5h. 20m., and the ebb 7h. 0m., the latter beginning 0h. 40m. after high water, and the former 1h. 40m. after low water. In the upper part of the port the ebb and flood are of the same duration, the greatest velocity 2 knots on the ebb  $1\frac{1}{2}$  on the flood.

**BUOYS.**—In running up the harbour, red buoys should be left on the starboard hand, black buoys on the port hand.

The capabilities of the port of Otago could not be better shown than by the fact that the ship *Achilles*, of 1,520 tons register, drawing  $21\frac{1}{2}$  feet of water was on the 3rd of July 1870 safely piloted into this harbour, and anchored at port Chalmers in the dark; also, that only three wrecks have occurred at the entrance since the formation of the settlement. As these wrecks, with ordinary management, might have been avoided, they cannot be received as evidence that the entrance to this harbour is dangerous, and

it is stated that a larger amount of shipping has visited port Chalmers, and fewer casualties have happened therein, than in any of the other principal ports of New Zealand.

**Dock.**—This dock is the only graving dock in New Zealand. It is situated in Koputai bay, and capable of taking any vessel likely to enter port Chalmers, until the bar entrance deepens considerably. A channel has been dredged through the bank, to the depth of 16 feet, to the entrance, and is in course of being deepened, 1872.

Dimensions of dock :—

Length over all	-	-	-	330 feet.
Breadth of entrance	-	-	-	68 „
Do. for ships bilge	-	-	-	43 „
Depth over sill at ordinary spring tides	-	-	-	21 „
Neaps	-	-	-	17½ „

There is also a small floating dock used for coasting vessels.\*

**Quarantine.**—The buildings intended to form a quarantine establishment, are in course of erection, 1872, on the Halfway islands.

This being the wool season (November), no less than nine fine merchant vessels are loading in this harbour, portions of their cargoes being brought down from Timaru, Oamaru, and other roadsteads on the east coast of the island. Flax and preserved meats are the other principal exports.

**COAST from OTAGO to NUGGET POINT.**—From Tairoa head the coast runs S.S.-Easterly for nearly 7 miles to cape Saunders ;† this bold and remarkable headland is the south-eastern termination of the peninsula which forms the southern side of port Chalmers, and from it the land trends away S.W. by S. in a curvilinear form towards Quoin point, a rounded projection, 30 miles distant. The intermediate coast forms a deep bight, the land being moderately high, and in some parts thickly wooded.

The off-lying rocks and islets in this bight are, first, the Gull rock, the outermost of a cluster, standing nearly one mile from a cliffy head, 5 miles S.W. of cape Saunders. Nearly 7 miles westward of Gull rock, and a mile from the coast, is White islet, and at the same distance from the shore, 5 miles further westward, is the small Green islet. On the coast midway between the two latter islets is Black head, a rather remarkable rocky head, and immediately within rises the well-named Saddle hill of Cook.

From Black head the coast line is low, with a shingle and sandy beach, and curves round for 11 miles to Taieri river ; this river, which is navigable at its entrance for vessels of from 6 to 9 feet draught, is nearly 25

\* Nav. Lieut. Petley, H.M.S. *Dido*, 1872.

† About one mile from the South point of Wickliffe bay, which is midway between Tairoa head and cape Saunders, a reef, with less than 6 feet water on it, was reported in 1868.

miles from cape Saunders ; its north entrance point projects half a mile to the eastward, and is formed by a small island of the same name. The coast now rounds away to Quoin point, 6 miles southward of Taieri river, and has rocky ledges extending about half a mile off shore. Cook's head, a remarkable rock on the beach, is 4 miles south-westward of Quoin point.

**NUGGET POINT**, 22 miles from Quoin point and 52 miles from cape Saunders, is the southern extreme of Molyneux bay. It is a bold and projecting headland, the termination of a remarkable razor-backed mountain ridge, with three pointed rocky islets standing nearly half a mile off it.

**LIGHT**.—The lighthouse stands on the extremity of Nugget point, and is a stone tower, 31 feet high, painted white ; the light is a *fixed* white light, elevated 250 feet above the sea level, and in clear weather should be seen 23 miles.

**MOLYNEUX BAY**.—Anchorage may be obtained in this bay with off-shore winds, in 8 fathoms, about half a mile off the landing-place, and the same distance northward of Reef point ; this point is little more than two miles N.N.W. of Nugget point, and has a reef of rocks extending three-quarters of a mile from it. Coal is found in a cliff on the north side of this bay, 7 miles from the mouth of the Clutha river ; on either side of this river are extensive clumps of wood.

**Clutha river** (*Matau*) runs into Molyneux bay  $4\frac{1}{2}$  miles northward of Nugget point ; this is a considerable river with deep water, and is broad within the entrance, but a constant fresh running out at the rate of from 3 to 5 knots renders the narrow entrance unfit for anything but boats, when it must be taken at or near high water ; the bar is rocky and dangerous, still it is possible that small steamers might navigate the river with advantage.

**Current**.—Between cape Saunders and Nugget point, a current of one knot an hour is generally found to set to the northward.

**Soundings**.—The 100 fathom line of soundings extends 20 miles from the coast, and decreases regularly towards the shore ; at the distance of 2 miles there are 12 fathoms, sand ; large vessels, however, are not recommended to stand in nearer than a league.

**COAST from NUGGET POINT to FOVEAUX STRAIT**.—From Nugget point the coast trends S.W. by S. 14 miles to Long point ; thence S.W. by W. 11 miles to Chaslands Mistake, and from the latter W.S.W. 14 miles to Slope point ; southward from Nugget point the coast becomes much broken, with occasional islets and reefs, which, in the absence of any regular anchorage for shipping on this coast, prove of great benefit as places of refuge to the boats engaged in the whale and seal fisheries. It is not uncommon for whale boats to make the passage from Stewart island or the north shores of Foveaux strait, to the settlement of Otago, a distance of

140 miles, taking advantage of these boat harbours on the approach of bad weather, which on this coast is of frequent occurrence.

Three miles southward of Nugget point is False islet, connected with the main by a sandy neck.

**Catlin river**, half a mile to westward of False islet is Catlin river, navigable for small vessels ; the bar, on which is a depth of 5 feet at low water, breaks with swell from N.E. to South.\* High water, full and change, 2h. 30m. ; springs rise 8, neaps 4 feet ; strength of tide, 2 to 3 knots, ebb and flood. The township of Newhaven stands on the north bank of the river, half a mile inside the bar, where the channel is one-third of a cable wide. Two miles and a half farther on is the small islet of Tuawike, close to the shore ; inside is a boat harbour. White head, a bold cliff, is  $1\frac{1}{2}$  miles to the southward of it.

**Long point** (*Irihuka*) is the next projecting headland ; it is similar in character to the Nugget point, but without the rock islets off it. Two miles to the north-eastward of it is Cosgrove island, inside which there is landing in fine weather ; abreast this part of the coast, at the distance of 2 miles from the shore, there is 25 fathoms over a bottom of fine sand, and between 50 and 60 fathoms at the distance of 5 miles ; in coming from the northward, the influence of the Foveaux strait tide commences to be felt here. The coast now trends more westerly.

**Tautuku**, a sandy bay, 6 miles in length, sweeps round from Long point ; at the western extreme of this bay is the river of the same name, a rapid stream, sweeping over a bar dry at low water ; an old whaling station is at its mouth, and there is anchorage off it in 7 and 9 fathoms, with westerly and north-west winds, but exposed to south-west ; there is also a boat harbour at the eastern end of the bay, sheltered by Long point. The land over this part of the coast is a series of irregular hills, rising as high as 1,300 feet, with rounded outline, and diminishing both in height and ruggedness of appearance to the northward.

**Chasland's Mistake** (*Makate*) is a rather remarkable black cleft cliff ; it is nearly 11 miles from Long point, and has a high rock standing off the shore a mile to the north-east of it.

**Brothers point**, which has two rocky islets standing off it, is 5 miles westward of Chasland's Mistake, the coast forming a bight between them, in the centre of which is a boat harbour ; there is also another boat harbour close to the westward of the point itself.

**Waikawa river**, with 3 fathoms on its bar at low water, but a very narrow entrance, and strong freshes always running out, is 3 miles westward of Brothers point ; just to the eastward of its entrance is a white bluff. Small vessels have laid secured to the shore within the river, but exposed to considerable dangers from the freshes, as well as the swell from southerly gales.

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\* See plan on Admiralty chart, No. 2,533, scale,  $m = 2 \cdot 0$ .

From the Brothers point the coast line decreases in elevation, and is backed by a range of undulating hills, apparently well adapted for pastoral purposes. The tide of Foveaux strait slackens considerably off this part of the coast, and there is a longer stream to the north-eastward. Five miles westward of Waikawa river is Slope point, the southern extreme of the Middle island of New Zealand; this is one low treacherous point, the sea breaks for more than one mile off it; it is only remarkable from the sloping mountain rising to 1,300 feet, 7 miles to the northward.

**Waipapapa point**,  $7\frac{1}{2}$  miles westward of Slope point, is low and sandy; between Waikawa river and this point the coast is fronted with numerous rocky ledges, which render it imprudent for vessels to approach within a league; its exposed character and irregular tides render it also unsafe for boats, unless in very fine weather.

Waipapapa point is the eastern extreme of Totoes bay; it slopes gradually down to the sea from a mountain summit, 14 miles to the north-east of it. The sea is said to break heavily at times 5 miles off this point, in 7 and 10 fathoms; it should therefore be approached with great caution.\*

**Mataura river**.—Five miles north-west of Waipapapa point in the bight of Totoes bay, is the entrance of this river, with only 2 feet on the bar at low water. It drains a large extent of valuable country, and near its junction with the sea overflows a considerable quantity of the land.

Between Mataura river and Waipapapa point, the Papanui, a mountain stream, runs into the bay through a line of cliffy heads. From Mataura river to the Bluff harbour, a distance of 18 miles, the coast line is a low sandy beach backed by an extensive plain, the hilly country terminating at the eastern bank of the river.

**GENERAL REMARKS**.—It will now have been noticed, that from port Chalmers to Waipapapa point, which latter may be considered as the north-eastern entrance point of Foveaux strait (a distance of about 110 miles), there are no dangers which extend more than one mile from the shore, and very few which do not show; neither can there be said to be any very remarkable features by which the seaman may be enabled to ascertain his exact position. Nugget point, with its lighthouse, and Molyneux bay are conspicuous landmarks, particularly the latter, which shows as a deep bight from seaward, the land on either side of it being moderately high. Long point, Chasland's Mistake, Brothers, Slope, and Waipapapa points, though not very remarkable, may, with the assistance of the chart, be recognised at the distance of 5 miles: the water shoaling also gradually, as it does, within the 100 fathom line, 20 miles from the shore, will enable a vessel to judge her distance from the coast at night with tolerable accuracy.

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\* The soundings, off Waipapapa point, obtained by Commander Edwin, R.N., in 1873, confirm its dangerous character.

## CHAPTER VIII.

FOVEAUX STRAIT, AND SOUTH OR STEWART ISLAND, INCLUDING  
THE TRAPS ROCKS AND SNARES ISLANDS.\*

## VARIATION IN 1875.

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Bluff Harbour	-	16° 40' E.		The Snares	-	17° 0' E.
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**FOVEAUX STRAIT** separates the Middle from South or Stewart island, and lies in a W.N.W. and E.S.E. direction; the general width is 15 miles; and from Ruapuke island, which lies in the eastern entrance to the north-west end of Stewart island, a distance of 30 miles, it has a depth of from 15 to 28 fathoms over a sandy bottom.

Ruapuke island, lying nearly in the centre of its eastern entrance, and surrounded as it is in almost every direction by islets, reefs, and tide ripples, renders the approach from the eastward, unless in moderate weather, rather formidable to a stranger; there is, however, a clear passage on either side of it 5 miles in width, and with not less than 12 fathoms water.

The northern shore of the strait also, from Bluff harbour to the western end of Tewaewae bay, a distance of nearly 50 miles, is studded with islets and reefs, some of which extend 8 miles from the coast, and are not always visible; but notwithstanding these dangers, Foveaux strait has a clear navigating width, westward of Ruapuke island, of never less than 10 miles.

The greatest difficulty the seaman has to contend with is the extremely boisterous weather which this part of New Zealand is constantly subject to; gales from south-west to north-west, but more frequently from the latter direction, blow with more or less violence, and without regard to seasons, throughout the whole year, frequently continuing without intermission for many days, and then lulling for a few hours only to return with renewed violence. Vessels passing through the strait to the westward are sometimes weeks getting round the south-west extreme of the Middle island of New Zealand, which is barely a hundred miles from the eastern entrance; it is useless for a sailing vessel to attempt it, unless with a slant of wind, and a vessel bound this way is therefore recommended to remain at

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\* See Admiralty chart, Foveaux strait or Stewart island, No. 2,553; scale,  $m = 0.3$  inches, sheet 11, coasts of New Zealand, by Captain Stokes and Drury, R.N.

anchor in port William or Patersons inlet,—on the eastern side of the Stewart island,—until one occurs; indeed whalers or sealers bound to their fishing grounds and who visit the ports of Stewart island for refreshments or to refit, are almost the only vessels that attempt to pass through Foveaux strait to the westward.

**Current.**—There is also another difficulty to be encountered, which is, a current always setting to the southward round the south-west extreme of the Middle island; having once rounded this point, a south-west wind will carry a vessel in a short time into comparatively finer weather, but it is not an uncommon circumstance for a sailing vessel,—her fair wind falling before rounding this extreme,—to be set back by the current, overtaken by a north-west gale, and obliged again to bear up for Stewart island, which undoubtedly is the wiser course if the gale proves to be severe; it saves much wear and tear as well as anxiety; and after passing Saddle point of Stewarts island, smooth water will immediately be found, port William always accessible, and anchorage may be had anywhere off the coast between it and Saddle point.

Although the passage through Foveaux strait from the eastward cannot be recommended for anything but steam vessels, it may be convenient for vessels from the westward bound for Otago, or the Canterbury settlements, or indeed from the Australian colonies to England, to make the passage through this strait; and from the westerly winds so constantly prevailing, it could be accomplished with great rapidity and in smooth water, and those ugly dangers, the Traps rocks to the southward of Stewart island, avoided.

**SOLANDER ISLAND.**—Ships entering from the westward should make this island, which is an excellent landmark, indeed a perfect finger-post to the strait; it lies 22 miles south of the southward coast of Middle island, and  $W. \frac{1}{2} S.$  35 miles from the north-west end of Stewart island; it is nearly one mile in length, rises almost perpendicularly from the sea, and has a remarkable peaked summit 1,100 feet high, which in clear weather can be seen 13 or 14 leagues; adjoining it is a smaller islet lying little more than one mile to the westward.

By arranging to pass Ruapuke island,—distant 68 miles from Solander island,—with daylight, vessels may make this passage without difficulty, and often with considerable advantage.

The only port on the northern shore of Foveaux strait eligible for ships of burthen is the harbour of the Bluff (*Awarua*); its narrow entrance and very strong tides render it, however, at all times difficult of access to sailing vessels, although the extensive and magnificent plains which stretch from it without interruption for 80 miles to the northward must render it a place of considerable importance now that steam navigation

is introduced. Besides this anchorage, there are New and Jacobs rivers, the former eligible at certain times of tide, and in fine weather for vessels drawing 13 feet water, and the latter for smaller craft, the bar being nearly dry at low water.

On the southern or Stewart island shore there are several ports which are always accessible and safe, and where vessels may wait for an opportunity of entering Bluff harbour or New river.

Having now offered these general remarks on Foveaux strait, a more detailed description of its coasts, harbours, and dangers will be given.

**RUAPUKE ISLAND,\*** as before remarked, lies nearly in the centre of the eastern entrance of the strait, its north point being in a direct line between the low sandy Waipapapa point on Middle island, and port William in Stewart island, bearing from the former S.W. by W. 14 miles, and from the latter N. E. by E. nearly 19 miles. It is a low island of an irregular shape,  $4\frac{1}{2}$  miles long in a north and south direction, and about 2 miles in width, and may be seen from a vessel's deck at a distance of 12 or 14 miles; the central part is 140 feet high, and thickly covered with trees of stunted growth; the north point is a cliffy headland, with a hummock over it 220 feet above the sea. The principal dangers lie off the eastern side of the island.

**Green island** is  $1\frac{1}{2}$  miles in circumference, 190 feet high, and has a level outline. It lies nearly one mile east of Observation head, the eastern cliffy point of Ruapuke island; between them is the anchorage.

**The Seal rocks,** to the north-eastward of Green island, are high out of water, the dry part covering a space of two cables; reefs awash extend from them to the westward nearly three-quarters of a mile, and also to the south-eastward 4 cables; between these rocks and Green island there is a clear passage of three-quarters of a mile, with from 9 to 15 fathoms water. A sandy ridge connects the Seal rocks with Ruapuke island, on which the sea occasionally breaks in heavy weather.

**Toby rock** is the most dangerous in the neighbourhood; it is only awash at very low springs, and is not marked by kelp, as most of the dangers here are; it lies directly in a line with the north end of Green island, and the high part of the Seal rocks, bearing N.N.E.  $\frac{3}{4}$  E. distant  $1\frac{1}{2}$  miles from the latter, and E. by N.  $\frac{3}{4}$  N.  $3\frac{3}{4}$  miles from the north head of Ruapuke island.

**Directions and Anchorage.**—Vessels from the eastward, intending to anchor at Ruapuke island, should pass 5 to 6 miles southward of Waipapapa point; and when abreast it, the island will be generally visible. Green island

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\* See Admiralty chart, Otago to Matuara river and Ruapuke island, No. 2,533; scale,  $m = 2\cdot0$  inches, by Captain Stokes, R.N., 1849-51.



and the Seal rocks will be plainly made out at the distance of 6 or 7 miles, when a course may be steered direct for the former, which will lead clear of all dangers. When within half a mile of Green island, haul round the northern point, giving it a berth of a quarter of a mile in 11 fathoms, and anchor midway between it and Lee islet,—which latter is close off the north-east sandy point of Ruapuke,—half a mile from either in  $5\frac{1}{2}$  fathoms, sand bottom. Vessels should not go within this line, as there are several rocks and reefs, marked by kelp, extending half a mile from the beach, and which break in bad weather; Weather islet lies half a mile south of the anchorage, midway between Green island and Observation head.

With westerly or south-westerly winds this anchorage is safe, and has smooth water, but with strong southerly winds a swell rolls in. The Seal rocks and reefs, with Green island, protect it in a measure from easterly winds, but vessels should not lie here with these winds, when better anchorages can be found in the bays on the west side; indeed with the safe and excellent harbours of Stewart island so near, there could be no inducement for a vessel to ride out a gale here, unless in a case of actual necessity.\*

From this anchorage, there is a passage to sea between the Seal rocks and Ruapuke; vessels going out this way should pass about half a mile from Lee islet, to cross the ridge extending north-westward of the Seal rocks; on which, however, there is not less than  $3\frac{1}{2}$  fathoms at low water. A heavy tide race extends a quarter of a mile off the north head of Ruapuke; it is otherwise free from danger.

**Landing.**—The landing for boats is close round the Observation bluff, where there are some native houses. There is also a missionary station little more than one mile southward of the bluff in a sandy cove.

**Breaksea isles**, two in number, surrounded by rocks, lie  $1\frac{1}{2}$  miles off the missionary station, and a mile south of Green island. Two reefs above

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\* H.M. Surveying vessel *Acheron* rode out a very severe gale at Ruapuke anchorage, with three anchors down and steam up, between the 19th and 22nd of March 1850. On the 19th at noon the barometer fell from 29·65 to 29·43 inches, and the wind, which had been light from north-west, shifted to west and south-west, and rapidly increased to a gale, the mercury rising or falling as the wind lulled or increased in violence, which it did alternately until the 20th, when the barometer fell steadily, and at 5 p.m. of the 22nd, it was down to 28·46, then blowing a hurricane; from this time the barometer rose gradually, and the wind quickly moderated, and continued from south-west until the 25th. This was an exceedingly strong gale, and a heavy sea rolled into the anchorage from the southward, quite breaking over the small islets that sheltered it at other times in that direction. Beyond the low barometer and the cloud-capped mountains on Stewart island there was nothing to indicate the approach of this storm; the *Acheron* at the time was close off the Bluff harbour's mouth, with a light north-west wind, when she was suddenly struck by this gale, and with such violence that it was thought she would have been blown out of the strait, and not be able to regain Ruapuke anchorage.

water, or awash lie a short distance to the westward and south-westward of the isles.

Three rocky islets extend for half a mile off the south point of Ruapuke, they are known as the South islets.

**Kelly rock**, which is not marked by kelp, and only breaks occasionally, lies nearly a mile S.S.E. of the southern extreme of the South islets, and  $1\frac{1}{4}$  miles E.  $\frac{3}{4}$  S. from a remarkable black rock, the easternmost of the Hazelburgh group.

**Outlying islets and rocks.**—Between the south and west points of Ruapuke island is Henrietta bay, and off these points, extending for a distance of 4 miles in a semicircular form, are the Hazelburgh group, Half-passage and Fife rocks, and Bird island, together with several smaller patches inside and among them, which generally break; vessels, unless coasters acquainted with the locality, should not go within the line of these islets and rocks.

**Henrietta bay.**—On the occasion of the visit of H.M.S. *Brisk*, in 1867, to Ruapuke, a fresh easterly breeze was blowing, making it undesirable to anchor in the eastern roadstead, she therefore passed to the southward of the Hazelburgh group, and proceeding between it and South islets, anchored in Henrietta bay in 9 fathoms.

The channel between Hazelburgh group and South islets appeared perfectly clear, no soundings being obtainable with the hand lead, but in hauling into Henrietta bay from the southward the islets at its southern entrance should not be rounded too close, as the rocky patch on the north side of these islets appears to extend somewhat further in a north-westerly direction than shown on the chart.

There is a considerable native village at the south-east corner of Henrietta bay, and a well-sheltered landing place on the sandy beach.

The north-western side of Ruapuke island is perfectly free from dangers, with the exception of Tupis island, which lies close off West point, with a boat passage between, and another small islet lying off the west point of Caroline bay nearly half a mile, besides these there are believed to be none.

**Caroline bay**, on the north-west side of the island, is  $1\frac{1}{2}$  miles south-westward of the north head; it has a depth of 6 and 7 fathoms, with a large kelp patch in the centre, inside of which there is 3 fathoms.

It is to be observed, that although Ruapuke island has so many dangers near it, the greater part of them are above water, Toby and Kelly rocks are alone those that do not show; a strict look-out, however, is indispensable to ensure the safety of vessels navigating in its vicinity, and, unless intending to anchor, it is recommended not to approach within 4 miles in

any direction, except on its north-west side, and towards the north head where it may be safely approached within half that distance.

**Tides.**—It is high water, full and change, at Ruapuke island at 1h. 0m., springs rise 8, neaps 4 feet. A mile to the eastward of Toby rock, the easterly or flood stream commences 3 hours after it is low water by the shore, or at 10h. 0m. on full and change days, and like the westerly, it is of 6 hours' duration, running at the rate of from one to  $1\frac{1}{2}$  knots.

**EASTERN ENTRANCE OF FOVEAUX STRAIT.**—Approaching the strait from the eastward, there are passages northward and southward of Ruapuke island; either may be taken, according as the winds or circumstances may render desirable.

**NORTHERN PASSAGE.**—Passing along the south coast of the Middle island of New Zealand, at a convenient distance of 5 or 6 miles, the remarkable and solitary hill called the Bluff will be seen in clear weather 35 miles from a vessel's deck, or when abreast of Slope point.

This singular coast feature, which makes like a small islet, is nearly 900 feet high, rising suddenly from the western entrance of, and overlooking the harbour of the same name.

From abreast of Waipapapa point, steer for the Bluff when it bears W.  $\frac{1}{4}$  N. allowing for the streams of tide which here run east and west (true) about one knot an hour; this course leads 2 miles north of Toby rock, and  $3\frac{1}{2}$  miles from Ruapuke island. When the north end of that island bears south about 3 miles, port William in Stewart island will be distant 21 miles on a south-west bearing, which leads to the northward and westward of all the islands; if not bound there but through the strait, steer from the same position off Ruapuke, W.S.W., or for the high range of mount Anglem, on the northern end of Stewart island; this course will lead a vessel 2 miles to the southward of Dog island, a low dangerous islet lying to the south-eastward of Bluff harbour, with shoal water extending 2 miles eastward of it, where the sea breaks heavily, and in the neighbourhood of which the tides run from one to 3 knots.

When the Bluff summit bears north, a direct W.  $\frac{1}{2}$  N. course through the strait takes a vessel 4 miles to the northward of Stewart island, 9 or 10 miles north of Solander island, and 12 miles southward of Middle island. In working through Foveaux strait, a vessel should not stand to the northward into less than 20 fathoms, between Bluff harbour and Pahia point, to avoid the reefs in the neighbourhood of Centre island; this will leave a clear working width of 10 miles, though it is not recommended to approach within 3 miles of the White rocks or Rugged islands, at the north-west end of Stewart island, on account of the heavy

westerly swell and tide rippings which are generally met with there. The Mid bay reef in Tewaewae bay, on the north shore, must also be avoided; it lies in a line between the two points of the bay,  $4\frac{1}{2}$  miles from the western Sand-hill point, and only breaks occasionally.

Should a calm be met with in the strait, if not to the westward of Pahia point, vessels may anchor with a kedge in from 18 to 25 fathoms, and thereby avoid being drifted back with the tide; there is also anchorage in Tewaewae bay in from 9 to 13 fathoms, but a vessel should leave immediately a breeze springs up. After passing Pahia point, the water deepens to 30 fathoms, and shortly to 60, and the strength of the tides diminishes considerably.

When abreast Solander island, a vessel may shape her course according to circumstances, the current before noticed as setting to the southward, round the south-west extreme of the Middle island, will not be much felt at the distance of 10 or 12 miles from the coast.

**SOUTH PASSAGE.**—Vessels from the eastward bound to any of the southern ports of Stewart island would probably pass to the southward of Ruapuke island, in which case they have only to give it a berth of about 4 miles, and when abreast and 2 miles off Hazelburgh group, shape their course accordingly.

If intending to pass through the strait by this passage, the channel, which is 5 miles in width, with from 15 to 18 fathoms, lies between Hazelburgh group, Half passage, and Fife rocks,—extending off the south-west end of Ruapuke,—and the group fronting port William and Patersons inlet on the eastern side of Stewart island. Having passed about 2 miles southward of Hazelburgh group, and brought the Half passage rock to bear N. by W. steer N.W. or a mid-channel course until the Bluff summit bears north; a vessel will then have passed through clear of the islands on both sides, and the course should then be altered to W. by N.  $\frac{1}{2}$  N. for 18 miles, when mount Anglem will bear S.S.E., and a cluster of white rocks, 20 feet high, near the shore S.S.W. distant 5 or 6 miles; the channel course will then be west, and 40 miles in this direction should take a vessel abreast of Solander island, and nearly midway between it and the south coast of Middle island.

**Tides.**—The flood tide sets through Foveaux strait from west to east, and is the strongest between Bluff harbour and Ruapuke island; its influence is felt as far as Long point, 45 miles eastward of that island. Between Ruapuke and Stewart islands it sets to the south-eastward, running parallel with the shores of the latter. The ebb takes an exactly contrary direction.

It is high water, full and change, in the western entrance of Foveaux strait, that is, between the north point of Stewart island and Pahia point,

at 12h. 15m., the flood stream commencing from half an hour to 2 hours after low water, according to the winds, it being earlier with those from the westward.

Both the ebb and flood streams run for six hours. At the eastern entrance of the strait it is high water at 1h. 0m., the flood stream commencing at 10h. 0m., or three hours after low water.

Along the north-east side of Stewart island the flood or south-easterly stream runs for an hour and twenty minutes after it is high water at port William, or until 2h. 0m., on full and change days. The strength of the tide varies from a half to  $2\frac{1}{2}$  knots; in the narrow part of the strait, between Ruapuke and the Bluff, it is 3 knots.

**WINDS, &c.**—Irrespective of local influences, the prevailing winds on the southern coasts of New Zealand are from north-west to south-west; and it is not surprising, when the direction of Foveaux strait is considered (W.N.W. and E.S.E.), and its comparatively narrow entrance, that it should have a tendency to invite these westerly gales, or what would be no more than an ordinary gale or strong breeze a hundred miles at sea should blow through them with increased violence. The contrary, however, occasionally happens, and outside Solander island it will be a strong gale, when within it, and near the mouth of the strait, the weather is quite moderate.

It has been remarked that westerly winds prevail during all times of the year; such is the result of observations made in H.M.S. *Acheron* during parts of a summer and winter, and likewise of information obtained from several intelligent seafaring men, who have lived for many years in the neighbourhood, some of them owning and commanding whaling schooners built in the country. The following remarks are from both sources.

The fall of the barometer indicates a north-west wind, and frequently dirty rainy weather; these gales blow with great violence, generally lasting for four or five days together. Thunder, which is not of common occurrence, is said to be a sign that the gale will be of unusually long duration; it frequently continues to blow very hard after the mercury has risen, and with a high barometer, but the wind then generally veers to the southward of west. With a strong westerly or north-westerly wind in the straits, it is often from south-west in port William, or on the eastern shores of Stewart island, while on the western coasts the north-west wind generally draws from N.N.W., or even more northerly.

A casual north-east or easterly wind, with fine weather, in the eastern entrance of the strait, almost certainly turns to north-west as the western entrance is approached. The only wind to be depended upon to carry a vessel through is a south-easter; this wind may be looked for, during

summer, about once in six weeks. In the winter season, June, July, and August, it is more prevalent, and perhaps occurs twice in that period : it generally lasts from 24 to 48 hours, far more than sufficient to carry a vessel round the south-west extreme of the Middle island of New Zealand, and into comparatively fine weather, for it is frequently a south-west wind, with fine weather, to the northward of the West cape, while blowing a north-west gale, with dirty weather in the strait.

The barometer rises before south-east winds, and they often blow with great strength. A thick bank of clouds rising to the south-east, with rainy weather, and the tops of the hills clothed with a white mist nearly to the horizon, are considered by those acquainted with the strait as certain indications.

Before a south-easter also the groups of islands between Ruapuke and Stewart island appears much raised by refraction, but on going westward, should Solander island appear distorted beyond its usual dimensions, a westerly wind will certainly terminate the career of the easterly.

It may be observed that the resident whalers seldom attempt to work their best vessels through against a westerly wind, and H.M. steam-ship *Acheron*, with a sailing vessel employed as her tender, had abundant evidence of the difficulty of getting to the westward during the survey of the strait in 1851.

**ASPECT of COUNTRY.**—The remarkable hill or headland which rises immediately over the entrance of the Bluff harbour, and which has been so frequently mentioned in the description of Foveaux strait, forms a conspicuous and striking feature, contrasted with the great extent of level land in its vicinity, and it may be said to be to the eastern entrance of the strait what the Solander island is to the western, a most useful and unmistakeable land mark. It stands at the south-east extreme of a narrow and irregular-shaped promontory, which forms the Bluff harbour on its southern side, and the entrance to New river on its northern, these two ports being separated from each other by a low neck.

From the summit, which is 855 feet above the sea, a magnificent view may be obtained. Seaward, looking easterly, the coast line is seen nearly as far as Brothers point. To the south-east Ruapuke island, and the extensive groups of rocks and islands which stretch from it across to Stewart island. To the southward, the shores of Stewart island, from port Adventure on its eastern side, to Rugged point and isles at its north-west extreme, including the entrances of Patersons inlet and port William, with a full and clear view of Foveaux strait and its numerous islets and reefs. To the westward will be seen Solander island, and the whole stretch of coast line of Middle island may be traced as far as the Big river, a distance of 60 miles. Inland, far as the eye can reach, there is an unin-

errupted view of either a level or gently undulating country, bounded to the westward by a range of mountains, stretching from the sea near Jacobs river to the high mountain ranges of the great central ridge, and to the eastward by the hills stretching from Nugget point to the north-westward; due north the level country joins some lofty insulated ridges from 60 to 80 miles distant, and varying in elevation from 5,000 to 7,000 feet. This region is the southern portion of the great lake country of the interior whose waters are carried off by the Clutha, Mataura, New, Jacobs, and Waiau rivers.

**BLUFF HARBOUR\*** (*Awarua*)—formerly a large whaling station—is at high water an extensive sheet of water stretching in two arms to the north and east, respectively 4 and 5 miles. The available space for anchorage, however, is narrow and confined, and, for vessels of large tonnage, not extending much above a mile from the entrance in a north-westerly direction. Above this, as well as the whole of the eastern portion, is flat and shallow, the greater part being uncovered at low-water. The tides run very strong, during the springs as much as 7 knots; there is also a heavy tide rippling at the entrance, caused by the meeting of the harbour tide with that in the strait. The entrance to this harbour (which is now much frequented by the mail steamers) has been buoyed, as also has the harbour itself.†

**DIRECTIONS** (1867).—Vessels coming from the eastward, intending to enter by the north passage, should steer for the sandy point about 3 miles to the eastward of the harbour, until within half a mile of the shore, when a black buoy will be seen, which marks the north-east end of the sand spit. In moderate weather the pilot will board here, but should the pilot boat not be in sight keep along the land about W. by N., leaving the buoys on the port hand, pass a cable off Tewaewae rock (the eastern extremity of North head, which is about 10 feet above water and bold close to), and steer across for a large rock on the beach of the western shore with a white patch on it, off which the pilot can board in any weather. Vessels drawing over 16 feet water should not take this passage at or near low water.

Vessels from the eastward taking the passage between Dog island and the sands should give the island a berth of half a mile, and steer about west for Lookout point until Starling point bears North, then steer in to pass about  $1\frac{1}{2}$  cables off Starling point, leaving the red buoys on the starboard hand, and when abreast of it the pilot boat should be seen.

\* See Admiralty chart, No. 2,540; scale,  $m=2\cdot0$  inches, Awarua, or harbour of the Bluff, and New River, by Captain Stokes, R.N., and officers of H.M.S. *Acheron*, 1851.

† See page 13 for the general harbour signals.

The best time for a large steamer or a sailing vessel with a fair wind to enter is at high water or first quarter ebb; but sailing vessels during westerly winds should be at the heads at half flood.

Entering by either channel leave the red buoys on the starboard hand, and the black on the port.

No information has been received as to the position of the buoys.

The Bluff or western shore must be kept on board within less than two cables by vessels coming from the westward, as an extensive bank with shoal water lies off the entrance, leaving a passage of one-third of a mile only between its western end and the Bluff coast, with from 5 to 9 fathoms water.

**Anchorage** for small vessels may be had in 5 fathoms abreast Starling's house, which is on the Bluff shore, close to the water, and at a short distance within Starling point. In westerly or northerly winds this is a safe and convenient anchorage, but with strong southerly winds a vessel should run higher up.

Large vessels intending to make any stay should anchor one mile above Starling point, within  $1\frac{1}{2}$  cables of the western shore, in 4 fathoms; after passing this point, a mid-channel course may be steered between the two entrance points. There is a patch of rocks in the narrowest part of the channel, more than a cable from the western shore, but the line of shoal water on either side is marked by kelp, which, however, during the strength of the tide is run under. The upper anchorage is secure in all winds.

**DOG ISLAND** lies  $2\frac{1}{2}$  miles S.E. by E. from the entrance of Bluff harbour; it is low, and three-quarters of a mile in extent; the sea breaks heavily for some distance off its northern and eastern sides.

**LIGHT.**—A light is exhibited from a lighthouse erected on Dog island. The light is a *revolving* white light, attaining its greatest brilliancy every *half minute*. It is elevated 150 feet above the mean level of the sea, and in clear weather should be seen at a distance of 18 miles.

The tower is of gray stone, 118 feet high from base to vane.

**Tides.**—It is high water, full and change, in Bluff harbour, at 1h. 18m., springs rise 8 feet, neaps 6 feet.

From the scarcity of harbours on this part of the coast, and the position of this one with respect to the great plains which approach so near it, the Bluff harbour will undoubtedly, when the tide of emigration sets in in this direction, become a port of considerable importance;\* although in consequence of its narrow entrance and great strength of the tides, the access to it must always be attended with a degree of risk to large sailing vessels. To steamers or small vessels, choosing the proper time for entering, which is high water or first quarter ebb,—no difficulties will

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\* A custom-house has been established at the Bluff harbour (1857).



present themselves. This harbour will also derive considerable advantage from the ports of Stewarts island being so near, where vessels may lie in perfect security, and wait their opportunity to enter; port William is peculiarly eligible for this purpose, and in the event of the Bluff country becoming colonized, ships would probably make it their head quarters. Cargoes might be conveyed across, and communication easily kept up by small vessels; the distance is only 16 miles in a N.N.E. direction, and the prevailing winds favour the passage across both ways; with south-westerly, westerly, or even north-westerly winds when not too heavy, a vessel leaving port William at the last quarter of the ebb, would be at the entrance of the Bluff harbour by the first of the flood.

From the Bluff, the coast trends N.W. by W., in two rocky bights, to Steep head, distant 8 miles; the latter is a steep, black, cliffy headland, with a small rocky islet off its extreme, and forms the southern entrance point of New river.

**NEW RIVER\*** (*Orete*) is accessible in moderate weather, at high water, for vessels drawing from 13 to 15 feet water; but from the exposed and shifting nature of the bar, and channel within, as also the rapid tides, it is essential that a stranger should employ a pilot, who is now (1858) established at the port. From its proximity to so large and fertile a district, New river will perhaps eventually rival the Bluff harbour as a shipping port. It has afforded shelter to whale ship in distress of 500 tons,—the *Bombay*.

The south or outer entrance point is well marked by Steep head and Point islet; the northern is low and sandy. A shifting bar, with 9 and 10 feet at low and 16 feet at high-water ordinary springs, runs across from Steep head to an extensive bank of sand, extending from the North point, which covers at half tide; the bar is narrow, and the water soon deepens within to 4 and 5 fathoms, till the Bombay rock,—4 feet above water,—is reached, and to which the anchorless ship of that name was secured.

**Directions.**—Vessels bound for the New river should approach to within a cable of Point island, in 5 fathoms, then steer for a spiral-shaped *black* buoy outside the bar, in 6 fathoms, bearing from the north end of the island north, half a mile. As the buoy is approached the leading *white* beacons will come on, bearing E.  $\frac{3}{4}$  S., keep them in one, leaving the *black* buoy on the port hand, and the bar will be crossed in 15 feet, low water springs, the breadth is about a cable, and inside in 4 fathoms is a spiral-shaped *white* buoy marking the south side of the channel; keep between the white buoy on the starboard, and black on the north side.

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\* See Admiralty chart, Awarua, or harbour of the Bluff and New river, No. 2,540; scale,  $m = 2 \cdot 0$  inches.

**Tides.**—It is high water, fall and change, in New River at Oh. 10m.; springs rise 8, neaps 4 feet.

The Bombay rock is  $1\frac{1}{2}$  miles inside Steep head, and the width of the river here is from 3 to 4 cables. The general course in is E.  $\frac{1}{2}$  N. gradually hauling up N.E. as the rock is approached; passing north of it, anchorage may be had in 3 fathoms at low water, a long cable from the northern shore, with the low sand hills of the north entrance point bearing W.N.W.

Compared with the Bluff harbour as a port for shipping, it has the advantage of access to the interior, while the tides are not nearly so strong; the Bluff, however, is a better port, and being without a bar, is accessible for vessels of any tonnage. New river was ascended by a whale boat from H.M. surveying vessel *Acheron* for a distance of 25 miles, through a low rich grazing country, wood scarce and in clumps.

**Invercargill.**—On the plains of the Bluff, 8 miles within the entrance of New river, on the eastern margin of an extensive shoal estuary, the settlement of Invercargill was established in 1856; the district inland, having great pastoral capabilities, with a large extent of fine agricultural land on the seaboard, well wooded, will probably rapidly rise to importance, its present population (1871) is 1,960.

**COAST WESTWARD of NEW RIVER.**—From New river the coast trends in a long sandy beach to the north-west, 15 miles, when it curves round to Howell point, and forms a shallow bay or bight just within it. In this bight, a mile and a half north-west of that point, is the entrance of Jacobs river, the bar of which is nearly dry at low water, but vessels of 7 or 8 feet draught enter at high water. There is also anchorage in Howell road, about one mile off the river's mouth, where vessels may wait for the tide, to enter, but they should not lie there in southerly or easterly winds.

From Howell point the coast trends W. by S.  $\frac{1}{2}$  S. 10 miles to a projecting rocky point (*Wakaputa*). Midway between, at the western end of a sandy bay, is a native village, where a small mountain stream runs down, with a boat harbour at its mouth; this is remarkable as the last fixed native settlement on the coast. From *Wakaputa*, a rocky and indented coast trends north-west 6 miles to *Pahia* point, the eastern extreme of *Tewaewae* bay.

**Dangers.**—The northern shore of Foveaux strait, from New river to *Pahia* point, a distance of 25 miles, is fronted with numerous detached reefs and rocks, extending in some cases as far as 8 miles from the coast. Among them is a well marked island, *Centre* island, which lying nearly at the outer or southern boundary, will be found a good guide for avoiding them.

**Centre island** is of a triangular shape, moderately high, and about three-quarters of a mile in length; it lies 4 miles S.E. from Wakaputa point, and W.  $\frac{3}{4}$  N. 22 miles from the Bluff, and has a sunken rock (the Hapuka), a little more than one mile S.W. of its centre. Midway between it and Wakaputa point are two extensive reefs awash, with a high rock on the east end of the southernmost one.

**Fish reef**, which lies 3 miles south-westward of Wakaputa point, is an extensive patch; it breaks, and has 26 fathoms close outside it.

**Escape reefs**.—The most southerly of the many dangers on this coast are the Escape reefs, 4 miles eastward of Centre island. They are two detached reefs lying W. by N. and E. by S. of each other and  $1\frac{1}{2}$  miles apart; each has a solitary rock about 20 feet above the sea. The eastern reef is 4 miles from Centre island, on the same E. by S. bearing, and from the north point of Stewart island it bears north 12 miles,—S. by W.  $\frac{1}{2}$  W.  $7\frac{1}{2}$  miles from Howell point, and W.  $\frac{3}{4}$  N. 18 miles from the Bluff. N.N.E., about one mile from each of the Escape reefs, lie two other reefs awash.

**Fig island**, a low round island, lies  $2\frac{1}{4}$  miles S.W. by S. of Howell point, with a sunken rock half a mile to the south-eastward of it, and two reefs awash between it and the shore.

**Half-way rocks** are two rocks standing well out of the water lying in a north-west and south-east direction, and nearly three-quarters of a mile apart; the south-easternmost bears N.W. by W. 4 miles from Steep head, and is  $3\frac{1}{2}$  miles from the sandy beach to the northward; a mile inshore of them are two other rocks awash, between which and Half-way rocks are 7 fathoms water.

**Doubtful rock**.—This sunken rock, which only breaks in heavy weather, and whose exact position is doubtful, is placed on the chart bearing from Steep head of New river W.  $\frac{1}{4}$  N.  $7\frac{3}{4}$  miles; from Howell point S.S.E.  $5\frac{1}{2}$  miles, and from the southernmost of the Escape reefs N.E. by E.  $\frac{1}{2}$  E. 4 miles, which cannot be far from its true position.

**Caution**.—There is deep water among and between many of the dangers just enumerated; they should be therefore approached with caution, and avoided in thick weather. Vessels are recommended not to pass within the 20-fathom line on this part of the coast, and to keep 3 miles to the southward of the Escape reefs and Centre island. The coast between Wakaputa and Pahia points should not be approached within 4 miles by passing vessels.

**TEWAEWAE BAY**, lying to the westward of Pahia point, is a remarkable square shaped bay, 7 miles in depth; Sand hill point, its western extreme, bears W.  $\frac{1}{2}$  S. 15 miles from Pahia point, and was so named from the coast terminating in a ridge of low sand hills projecting from

the high mountain land 5 to 6 miles northward; there are several detached rocks and reefs extending one mile off it, and at the distance of 2 miles from the shore 16 and 18 fathoms will be found; 2 miles northward of this point is Muscle beach of the whalers, a small cove with a deserted whaling station, off which there is good anchorage in 5 fathoms, with all westerly winds, even as far round as south-west, but a heavy swell sets in with the wind in a more southerly quarter.

Two rapid barred rivers in the north-west, and north-east corners of Tewaewae bay carry to the sea the waters of a wild mountain region; the easternmost river apparently traverses a grassy district, and flows from a large lake in the interior; the natives, carried by a rapid current, descend on rafts during their excursions to the sea coast from the country at the back of the ranges near Milford haven. The westernmost of these rivers separates the open country from the remarkable mountainous district to westward.

**Mid-bay reef** is a treacherous reef lying in a direct line between the points of Tewaewae bay, and 4 miles from Sand hill point, which in moderate weather only occasionally shows itself, and is surrounded by a depth of 12 fathoms; the soundings in the bay range from 15 to 5 fathoms, but in southerly and heavy south-west gales it breaks all over.

**COAST from TEWAEWAE BAY to PUYSEGUR POINT.**—From Sand-hill point the coast trends a little to the southward of West, 24 miles to Green islets, and has rather a low rocky outline, without remarkable features; the subsiding spurs from the back mountains almost reaching the coast;—a constant surf breaks on this line of coast.

Six miles eastward of the Green islets, Patupb, or Big river of the whalers, runs into the sea; its mouth is fronted with numerous rocks, inside which is a small place of refuge for sealing boats, known as Price's boat harbour; Green islets,—a small cluster of that colour with some rocks,—fronting, the shore, point out the locality.

From Green islets the coast curves back, trending W.  $\frac{1}{4}$  S. 7 miles to Windsor point, and N.W.  $\frac{1}{2}$  W. 3 miles to Puysegur point, the south-west extreme of Middle island. One-third of a mile off this latter remarkable low sloping projection lies Marshall's rock; it is large, flat topped, and forms rather a conspicuous coast feature. Boats pass inside it in fine weather.

#### SOUTH, OR STEWART ISLAND.

This portion of New Zealand, which was first seen by Captain Cook in 1770, and considered by him as part of the Middle island, was in 1808 discovered to be an island by the master of a merchant vessel, whose name by common consent it has since retained.

In connexion with the extensive pastoral country adjoining it on the Middle island, and which is so deficient in harbours, it bids fair to become of some importance, as it possesses, on its eastern and south-east sides, several excellent ports, affording every facility for shipping. At a former period, even before the labours of the missionaries had commenced in the North island, Stewart island and the adjacent coasts and islets had become the head-quarters of numerous European sealing and whaling shore parties, who acquired much influence over the native population, and many of these people, with numerous half-caste descendants, still reside there, forming in themselves an exceedingly interesting community; indeed they were (1851) by far the most numerous occupants of the soil.

The island is of an irregular triangular shape: its western or longest side runs in a north and south direction 39 miles, its north-east and south-east sides are respectively about 33 and 30 miles in length, and its greatest breadth is little more than 20 miles; it is for the most part mountainous and thickly wooded with timber adapted to shipbuilding and other purposes. An irregular ridge of mountains, of which mount Anglem, 3,200 feet above the sea, is the highest, runs in an east and west direction along the north coast of the island; almost in the centre, between the head of Paterson inlet on the east side and Masons bay on the west, rises a remarkable dome-shaped mountain (*Rakeahua*), of 2,110 feet elevation, and which in clear weather may be seen from nearly all points. The south end of the island is also extremely hilly, though the land does not attain such an elevation as in the north. Finger and Lees, bare granitic peaks, rising from the flat land north of port Pegasus, are very remarkable. The coasts are studded in many parts with numerous islets and rocks, worn and crumbling from the boisterous sea which is incessantly breaking upon them.

Commencing a description of Stewart island from its north-eastern extreme, Saddle point, the coasts and harbours of its eastern and southern sides will be the first described, and afterwards those on its western shores.

**SADDLE POINT**, remarkable in feature and position, is a rather low projecting point, the end of a spur from mount Anglem, lying 3 miles south-west of it. From the Bluff on the opposite shore it bears S.W.  $\frac{1}{4}$  W. 15 miles, and forms the breaking point of the westerly swell in Foveaux strait; after rounding this point, however hard it may be blowing from the westward, shelter, with comparative smooth water, is immediately met with. From Saddle point the coast trends S.E.  $\frac{1}{4}$  E.  $8\frac{1}{2}$  miles to the entrance of port William; midway between them, at the northern end of a sandy bay, is a small stream known as the Murray river.

**Murray River**, off which is good roadstead in all winds westward

of north-west; the anchorage is little more than half a mile off the shore in 9 fathoms. The river itself is a mere stream; its entrance, however, forms a good boat harbour, and on the banks is the principal half-caste settlement in the island; a clean sandy beach of  $1\frac{1}{2}$  miles in extent, with a small portion of level land within, extends to the south-eastward of the river. The best anchorage is off the northern end of the beach, as it is in a measure protected from any north-west swell by a projecting rocky head: a vessel, however, should run for port William, if the wind veers to north-west and blows hard,—as it almost invariably will from that quarter,—although, as it has been before observed, a strong north-west wind in the strait is frequently to the southward of west on the Stewart island shore.

In moderate weather anchorage may be had, if necessary, along the whole line of coast between Saddle point and port William, one mile from the shore.

**Gull rock** is a white rock close to the shore,  $3\frac{1}{2}$  miles north-west of the west head of port William, and forms in appearance the south-east head of Murray river sandy bay.

**Newton rock**, a dangerous sunken rock lying E.  $\frac{1}{2}$  N. one and one-tenth miles from the Gull rock, and N.W.  $\frac{3}{4}$  W.  $2\frac{3}{10}$  miles from the west head of port William. It is a long mile from the nearest land, has 6 feet on it at low water, and is not marked by either break or tide ripple; it is therefore an unusual feature in the navigation of these coasts, and, lying directly in the track of vessels running between Saddle point and port William, must be carefully avoided. There is a passage of 10 fathoms between this rock and the shore, and the same depth close round it; small vessels generally pass inside. Leaving port William, a N.W.  $\frac{1}{4}$  N. course will pass more than half a mile outside it, and when Gull rock bears W.S.W. a vessel may haul up for Saddle point.

**PORT WILLIAM**\* is an excellent little port, and although apparently open for a large vessel to anchor in, it is sheltered from easterly winds by the coast about the Bluff harbour, Ruapuke island and the groups of islands and rocks between it and Patersons inlet; it is likewise so effectually protected from the swell that rolls round both ends of the island, caused by the constant westerly and southerly winds, that it becomes a perfectly secure haven. The port may be known by the bearing of the Bluff, which is N.N.E. 16 miles from its west head; its entrance bears also W.S.W. 6 miles from the most northern of the group of islands immediately off the port. Approaching from the northward, a remarkable white sand patch will be observed 3 miles westward of the entrance, or just southward of the Gull rock.

\* See Admiralty plan, Paterson inlet and port William, No. 2,541; scale  $m = 2 \cdot 0$  inches.

The position of port William, with regard to the Bluff harbour and adjacent country must always render it a port of value. The schooners engaged in whaling and sealing make it their head-quarters, and hauling into the northern head of the port are perfectly land-locked; large vessels lie further out, with the Bluff just shut in with the entrance point.

**Pender Rock**, which is the only danger in running into port William, is a 10 feet rock, lying three cables E.S.E. from the West head, well marked by a long kelp patch, which also serves to break the swell with easterly winds.

**Wood and Water.**—Wood and water may be had in abundance from a bay and river at the southern head of the port, where there is also a native village; refreshments may likewise be obtained, though only in small quantities.\*

Between two and three miles from the coast off port William and Paterson inlet, lie the groups of islands and rocks before mentioned; there is a good ship channel of 20 fathoms, one mile wide, between Bench island,—the southernmost,—and the groups northward of it. The smaller islands are barren craggy rocks, with strong tides and heavy riplings among them, and it is therefore not advisable in working to stand very close to them.

**Fish rock** is a little more than one mile eastward of the east head of port William, midway between it and the groups of islands which lie off; it is 30 feet high, with deep water close to, and tide riplings generally round it.

**Horse Shoe and Half Moon bays** are two small bays immediately southward of port William; they are much frequented by whalers, and afford good anchorage with off-shore winds in 5 and 6 fathoms. Half Moon bay, the southernmost, has a rock above water nearly in the centre, with a patch of 9 feet a short distance within it; there are a few settlers on its shore. N.E. by E., nearly 3 cables from the southern point of Half Moon bay (Akers point), is the Barclay rock, awash at low water; there is a passage for small vessels between it and the shore.

**PATERSON INLET.**†—The entrance to this spacious port lies 4 miles to the south-eastward of port William, between Akers and Anglem points, which lie nearly north-west and south-east 2 miles from each other. This inlet is a deep indentation, running in a westerly direction into the centre

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\* Remarks by Nav. Lieut. of H.M.S. *Dido*, 1872.—Port William abounds with fish. One settler only is living there now with his family, principally engaged in oyster dredging, finding a market for them at the Bluff. It is reported that the Otago provincial government intend colonising Stewart's island shortly, port William being the point of disembarkation.

† See Admiralty plan, Paterson inlet and port William, No. 2,541; scale,  $m = 2 \cdot 0$  inches.

of the island for a distance of 10 miles, and with a width in some parts of more than a league, being bounded on its northern and southern sides by high irregular land, and a flat valley running through the island from its head, the westerly gales rush down it with great fury, and ships should seek shelter in one of its numerous coves rather than anchor in its open waters.

Near the northern shore, one mile within Akers point, is Native island, (which is almost connected with the main land by reefs,) it extends to the south-east for three-quarters of a mile, and narrows the entrance of the inlet to about the same width. Anglem point is the north extreme of a remarkable peninsula, 3 miles in length, which affords protection to the inlet from easterly winds; this peninsula is almost divided in three places by narrow necks of land; the middle, which is known as the Old neck, is merely a low sandy beach.

**Directions.**—Vessels entering Paterson inlet from the northward should pass inside the group of islands off port William, and on either side of Fish rock. Approaching from the southward, they may either take the Carter passage between Anglem point and Bench island, the southernmost of the group,—and which has two remarkable rocks, the Twins, standing off its south-east extreme,—or Abbot passage, between Bench island and Fancy group; in the former case, Passage islet, with a reef extending  $1\frac{1}{2}$  cables off its eastern end, will be seen in mid-channel; there is a deep water channel of half a mile in width on either side of this islet. To the northward of Bench island, between it and Fancy group, there is a clear channel of one mile in width, with a depth of from 20 to 24 fathoms.

A reef of rocks extends to the north-west from Anglem point nearly one-third of a mile; this reef is awash, and has generally tide rippings off it; from 9 to 13 fathoms will be found in the entrance of the inlet, between it and Native island; and on the southern side some rocks, which are either awash or marked by kelp, extend for nearly a quarter of a mile off the northern coast of the peninsula.

**Cooper Island** lies almost in the centre of Paterson inlet, one mile inside the narrowest part of the entrance; it is 2 miles long in an east and west direction, and above half a mile in width; two small islets are off its south-west end, with two detached rocks awash at low water, lying a short distance to the westward of them; there are also some shoal patches a cable off the north-west end of the island, but they are marked by kelp.

**Sydney cove**, a sandy bight, about the centre of the north side of Cooper island, affords convenient anchorage in 9 fathoms for vessels making a short stay, but would not be desirable in easterly weather, when they should seek shelter on the western side of the peninsula off Old neck, in 10 to 12 fathoms, or in Glory cove.



**Glory cove**,\* which is the most snug and convenient anchorage in Paterson inlet, lies on the south-west side of the peninsula, 2 miles southward of the east end of Cooper island; the width of its entrance is 4 cables, and the general depth of water within from 4 to 6 fathoms with good holding ground: this is an excellent place for a ship requiring refit or repairs, and there is a point on the western side where, if necessary, vessels may be hove down with great facility, there being 18 feet at low water close to the beach. Vessels intending to anchor off Old neck or Glory cove may pass between the east end of Cooper island and the peninsula, avoiding a shoal patch marked by kelp which lies off the peninsula side; this passage is a quarter of a mile in width, with a depth of from 16 to 20 fathoms.

**South-West bay**, immediately to the westward of Glory cove, is an extensive sheet of water running in a south-westerly direction 3 miles, with an average width of one mile; the general depth is from 12 to 14 fathoms, but within one mile from its extreme, anchorage may be had in 6 fathoms; five islands lie off its western point, which narrow the entrance to half a mile.

For 2 miles above Cooper island, the main branch of Paterson inlet maintains a width of nearly 3 miles, with a depth of from 12 to 16 fathoms water; in working up, the shores should not be approached within a quarter of a mile, as several islets and rocky patches extend nearly that distance off; they are all, however, marked by kelp.

**Kaipipi bay** lies on the north side of the inlet, 4 miles above Native island; it is a third of a mile in width, and has anchorage in 5 fathoms. Half a mile within, it shoals to 4 fathoms, and shortly afterwards to 10 feet.

Westward of Kaipipi bay, the inlet narrows to the width of one mile, and the soundings decrease to 12 and 10 fathoms. At the distance of 2 miles above there is an extensive bay on the north shore, which at low water dries within the line of its entrance points; the main arm bending to the south-west, runs in that direction for  $2\frac{1}{2}$  miles farther, with a width of half a mile, and carrying a depth of from 10 to 6 fathoms, when it terminates in a shoal creek, which dries a mile and a half from its head, leaving a narrow boat channel of 2 to 3 feet at low water.

**FORT ADVENTURE**† is 10 miles to the southward of Paterson inlet, the coast line between being a succession of bold rocky headlands, with occasional sandy beaches, but without shelter even for boats.

East head, a projecting headland, and the eastern point of Stewart island, is  $2\frac{1}{2}$  miles to the northward of port Adventure. Two miles from

\* See Admiralty plan, Paterson inlet and port William, No. 2,541, scale,  $m=2\cdot0$ .

† See Admiralty plan, Pegasus and Adventure ports and Lords river, No. 2,542; scale,  $\begin{cases} m=2\cdot0 \text{ inches.} \\ m=4\cdot0 \text{ " } \end{cases}$

this part of the coast the soundings range from 20 to 25 fathoms, sandy bottom, shoaling gradually as the shore is approached.

The port is small, and open to the eastward, but affords good shelter in all westerly winds; Entrance island renders the passage in narrow for large vessels to work through. Stirling head, the northern entrance point, is steep and cliffy, with a small islet (*Weka*) lying close off it;—the southern entrance point is formed by a peninsula, the south extreme of which, Shelter point, has a detached rock awash, lying nearly a quarter of a mile distant.

The best passage in is between Stirling head and Entrance island; this passage is scarcely 4 cables in width, but has from 14 to 20 fathoms, except a patch of 18 feet which lies W. by S.  $\frac{1}{2}$  S. 2 cables from the north point of the island. The passage southward of Entrance island has the same width, but has a rock in the centre of it, with 20 feet, which is marked by kelp; there is deep water on either side of this rock. When inside the heads there is a clear working width of three-quarters of a mile, with a depth of from 9 to 13 fathoms; on the south side there are several rocky patches, with no more than 9 feet on them; they extend a quarter of a mile from the shore, are marked by kelp, and have deep water between them. At  $1\frac{1}{2}$  miles within the entrance, the harbour terminates in three coves, in the southernmost of which, Oyster cove, small vessels might lie in safety with all winds.

**Weka and Wreck reefs**, lying off the entrance of port Adventure, are the principal dangers on this part of the coast. Weka reef, the northernmost, is a quarter of a mile in extent, detached, and although covered, always breaks; it bears from Weka islet N.E. by E.  $\frac{3}{4}$  E., distant  $1\frac{1}{4}$  miles, and from the north end of Entrance island N.E.  $\frac{1}{2}$  N. nearly  $1\frac{1}{2}$  miles. Wreck reef, so called from a small vessel having been lost on it, is also detached, and has a rock on it just above water; in bad weather it breaks very heavily; the position of this reef is E. by S. 2 miles from the east end of Entrance island, and N.E.  $\frac{1}{2}$  N. 3 miles from the outer Breaksea islet; from 29 to 33 fathoms will be found from one to  $1\frac{1}{2}$  miles outside of them, and 10 fathoms within half a mile of the south end of Wreck reef.

On the neck of the peninsula which forms the southern side of port Adventure is a native village, the southernmost inhabited spot in New Zealand.

From Shelter point the coast turns sharply to the S.W. by W., and presents a most rugged outline; a group of barren and craggy islands extend a mile and a half to the southward from the point, the sea constantly breaking over and between them with great violence. From their proximity to port Adventure, and forming a barrier to the enormous

swell which rolls along the south side of the island, they were named the Breaksea islands.

**BRUCE REEF.**—This serious danger, off the south-east extreme of Stewart island, which lies but little out of the sailing track of ships bound to the southern settlements of New Zealand, was discovered in the ship *Bruce*, Thomas Meiklejohn, commander, in her passage from Otago (by the south of New Zealand) to Calcutta, and first publicly brought to notice in 1861. It is described as two low rocks from 3 to 6 feet high, and close together, on which the sea breaks heavily, and lies in the direct track of vessels closely rounding Stewart island in proceeding to or from the southern settlements of New Zealand.

Its position, which appears to have been determined with some accuracy, is as follows :—

7 $\frac{1}{10}$  miles .. E. by N.  $\frac{3}{4}$  N. .. from Owen island off Lords river.  
 5 $\frac{1}{10}$  „ .. E. by N.  $\frac{1}{4}$  N. .. „ the extreme of the Breaksea isles.  
 3 $\frac{1}{4}$  „ .. E. by S.  $\frac{3}{4}$  S. .. „ Wreck reef off port Adventure.  
 7 $\frac{1}{4}$  „ .. S.E.  $\frac{3}{4}$  E. .. „ East head, north of port Adventure.

Soundings, though tried for, were not obtained in its neighbourhood from the rapid rate of sailing of the ship in passing the danger. The mariner is therefore warned to keep a vigilant look out.

**LORDS RIVER\*** is 3 $\frac{1}{2}$  miles to the south-westward of Shelter point, and may be known by a cluster of rocky islands lying off its eastern head, the coast between which and the Breaksea islands forms as a bight when seen from seaward; this little harbour is a narrow arm of the sea running in a W. by N. direction, and is a snug anchorage for a steamer or small sailing vessel; H.M.S. *Acheron* took refuge in it during a westerly gale with a heavy sea running outside, but it cannot be recommended for a large sailing vessel, as the entrance is only two cables wide, and it is necessary to haul sharp round the westward to secure a good berth, which is a quarter of a mile inside the western head in 6 fathoms, sand and gravel; here a vessel may lie perfectly land-locked; nearly two cables above this anchorage are two shoal patches marked by kelp, and 4 fathoms water may be carried one mile above the heads; boat navigation extends 4 miles, when the river dwindles into a rapid mountain stream, running over a granite bed.

**PORT PEGASUS†** may be recognized by three remarkable bare granite cones called Fraser peaks, from 1,000 to 1,430 feet high, which are over the south arm about one mile from the west side of Stewart island. The main

\* See Admiralty plan, Pegasus and Adventure ports and Lords river, No. 2,542; scale,  $m=4\cdot0$  inches.

† See Admiralty plan, Pegasus and Adventure ports and Lords river, No. 2,542; scale,  $m=4\cdot0$  inches.

entrance of this noble port is 17 miles S.W. by W. from Lords river ; the coast between has an irregular rocky outline, with numerous scattered rocks fronting the shore ; Black rock, the most remarkable, is about 20 feet in height, and not larger than a small vessel ; it lies  $1\frac{1}{2}$  miles from the nearest shore, and is 10 miles from the main entrance of port Pegasus. White rock is three-quarters of a mile from the coast, and is 2 miles westward of Lords river. Toetoes bay, a small sandy cove with a boat harbour at the head of it, is 6 miles westward of that river, and has a small islet standing off its eastern cliffy head ; at a distance varying from one to 3 miles from this coast, there are from 35 to 47 fathoms over a sandy bottom.

The port is 7 miles in extent north-east and south-west, lying parallel with the coast, which it gives a broken appearance to, from the many passages in ;—three islands lie in the entrance, which form the same number of ship channels between them ; the main or broad passage is a long half mile wide in its narrowest part, lies between Pearl and Anchorage islands,—the north-east and centre islands,—and carries a depth of from 20 to 24 fathoms, with no dangers. The southern or narrow passage is between Noble island,—the south-easternmost,—and the main land, and in its narrowest part is not more than 2 cables in width, with a depth of 15 fathoms. The northern or Whale passage is still narrower, being little more than a cable across, with a depth only of 5 fathoms—it lies between the northern shore and Pearl island ; between Noble and Anchorage islands, there is only a boat passage.

Either of the three ship channels may be taken according to circumstances, though Broad passage alone is recommended for a vessel of large size to work through ; it trends N.W. by N., and the Narrow and Whale passages W.N.W.

The port is divided into two distinct portions, the north and south arms, which are connected by a narrow strait,—Acheron anchorage ; Broad and Whale passages lead direct to the north arm, and Narrow passage to the south. In the north arm the general depth of water is inconvenient for anchoring, being from 20 to 25 fathoms, but anchorage in 12 fathoms may be had just to the westward of a small island which lies at the north head of the arm, 2 miles from the entrance. In the south arm the depth is more moderate, and anchorage may be had in from 12 to 14 fathoms half a mile within Narrow passage, between Micrometer rock and Noble island ; there are also several coves, within the entrances of which vessels may anchor in from 8 to 10 fathoms. Shipbuilders cove, on the north shore, has some rocks and shoal patches in it, which, however, are marked by kelp. Besides the Micrometer rock, which is a small rock above water, in the centre of this arm, with a reef extending nearly a cable to the northward of it, there are also several small islets scattered about, but no dangers not marked with kelp.

**Acheron anchorage** is a narrow strait, about 2 cables in width and  $1\frac{1}{2}$  miles in length, connecting the north and south arms of port Pegasus, it is formed by the main land on the north, and by Noble and Anchorage islands on the south, and affords the most convenient and sheltered anchorage in the port, in 9 and 11 fathoms, mud; three small islets, however, which lie in the eastern entrance, narrow it so much as to render it only fit for a steamer or small sailing vessel from that direction; this entrance, called *Steamers pass*, is south of the islets, and has a depth of from 10 to 15 fathoms. This anchorage therefore is not generally available for ships entering by Broad passage, but those entering the port by Narrow or south-west passages with a leading wind, and intending to make any stay, should take advantage of it: the western entrance is clear, and 2 cables across, and if preferred they may anchor in the broad part of the entrance in 11 fathoms, well sheltered.

Seal creek, a deep and narrow inlet, penetrates the shore in a northerly and then in a westerly direction from the western entrance of Acheron's anchorage.

**Water.**—Port Pegasus abounds in excellent timber fit for shipbuilding or other purposes, and no difficulty will be found in procuring fresh water from the streams in any of the coves. Wild fowl are numerous in some parts.

**WILSON BAY** is a deep indentation trending north and south, 4 miles south-westward from port Pegasus and 2 miles north-east of Cook's south cape of New Zealand; its shores are skirted with rocks, and being exposed with a depth of water from 14 to 20 fathoms, it can only be considered a retreat in case of necessity; small vessels may, however, obtain shelter in Burial cove, on its western side, half a mile from the head of the bay.

The southern end of Stewart island terminates in a block of land 4 miles in width, the extreme of which, the south-west cape, called by the natives the tail of the island, is 3 miles to the westward of Cook's south cape, and has sunken rocks extending nearly half a mile off it; the neighbouring land is high and bold, with a steep and rugged shore.

**THE TRAPS** are two dangerous and well-named reefs lying to the south-eastward of the south end of Stewart island. The north Trap reef covers a space of  $2\frac{1}{4}$  miles, and has two rocks near either extremity, 3 to 4 feet high, and resembling in size and shape a boat turned bottom up: the centre of the reef bears from Cook's south cape, E. by S.  $15\frac{1}{4}$  miles, and is distant 11 miles from the nearest land (between Wilson bay and port Pegasus), the depth of water between being 60 fathoms; 2 miles to the westward of this reef, there is 23 fathoms.

The south Trap reef does not cover so much ground as the north; it is nearly 2 miles in extent, with portions from 4 to 6 feet above high water,

and heavy breakers about it ; its centre bears from Cook's south cape S.E. by E., distant 20 miles. These two reefs bear from each other N.  $\frac{1}{2}$  W. and S.  $\frac{1}{2}$  E., distant little more than 9 miles ; H.M.S. *Acheron* had 48 fathoms water between them.\*

**SOUTH WEST COAST.**—The south-western side of Stewart island is fronted by an irregular group of rocky islands ; the most outlying of these, Wedge island, is one mile long, and fully 6 miles from the land ; these islands are all similar in feature, their western faces, steep precipitous cliffs, from 300 to 400 feet high, sloping to their eastern sides, where a boat harbour is generally found ; the natives frequent them during summer for mutton birds.

There are clear passages among these islands ; between the largest, Long island, and the mainland, there is a channel of  $1\frac{1}{2}$  miles in width ; the tides, however, run with great velocity, and render the passages hazardous to attempt. The northernmost of this group, Moggy isle, lies 5 miles N.N.E. from Wedge island, and is about the same size.

**PORT EASY**, a confined anchorage in 5 fathoms for small vessels, is occasionally frequented by sealing craft, and lies 9 miles to the northward of south-west cape ; its entrance lies north and south, and is about a quarter of a mile in width. Two small islets, the Brothers, lie 2 miles to the westward of its entrance, and the same distance north of it a rocky cluster of four islands, (Boat group), extend from the coast 3 miles to the south-west, and serve in some measure to break the sea.

Between port Easy and Mason bay, a distance of 15 miles, there is no shelter for vessels ; the coast presents an irregular outline of high rugged cliffs, on which a heavy westerly sea or swell is constantly breaking. A deep indentation runs in to the south-east, 3 miles southward of Mason bay, where boats may obtain shelter by hauling up inside the rocky ledges at the extreme head.

**MASON BAY** is a peculiar low and sandy feature on the wild and inhospitable west coast of this island ; it has a sandy beach 5 miles in length, with wooded flats lying at the base of the mountain ranges, running down from the dome-shaped peak in the centre of the island ; there is anchorage in its southern part in from 3 to 4 fathoms, protected from west and north-west winds by the Ernest isles, two jutting red cliffy faced islands. A heavy sea rolls into the bay from the northward, but small vessels can lay here well sheltered, and in case of emergency a large vessel, by getting sufficiently close to the Ernest isles, will be in a secure

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\* The ordinary north-east sea breezes of the east coast appear to be lost about the south Trap reef, being met by the N.N.W. wind of the west coast ; for this reason vessels bound either way should give the Traps a wide berth.—From the Remarks of Commander B. Drury, H.M.S. *Pandora*. A shoal called the Boomerang breaker is reported (1862) as lying about N.W. by N.  $3\frac{1}{2}$  miles from the South Trap.

anchorage. These islands lie close together, with a boat passage between; the south island is connected with the main land at low water by a sandy neck.

Guide rock, above water, lies nearly half a mile W. by S. from the north end of the northern Ernest island, and also a rock nearly awash 2 cables westward of its south-west end. Look-out-for reef, a dangerous patch, more than half a mile in extent, also nearly awash, lies N.N.W.  $2\frac{1}{2}$  miles from the northern extreme of the same island, with a clear deep-water channel between. On the same N.N.W. bearing, and little more than 3 miles from this reef, is another shoal, which only breaks occasionally; between them there a depth of 25 fathoms.

**CODFISH ISLAND** lies 9 miles N.N.W. of Ernest islands, and  $4\frac{1}{2}$  miles S.S.W. from the Rugged isles,—which latter extend off the north-west extreme of Stewart island. It is 3 miles in length in a north-west and south-east direction, and 2 miles across, moderately high, level-topped, and has a small stony eminence rising near its centre; between it and Stewart island is a passage nearly 2 miles in width, with a depth of 7 and 8 fathoms; High rock lies in the centre of it.

There is a confined anchorage in Sealers bay on its north-east side, well sheltered from all westerly winds, in 6 to 8 fathoms; this was formerly the head quarters of the sealers, but is now deserted. The western side of the island is composed of high rugged cliffs, with rocks and foul ground extending one mile off shore; at the distance of 2 miles there is from 30 to 36 fathoms, sand and gravel bottom.

On the coast of Stewart island, fronting Sealers bay is a castellated peak, strikingly bold and remarkable from its peculiar rocky formation. The coast southward of this peak, as far as the north end of Mason's bay a distance of 8 miles, is thickly strewed with rocks, extending one mile off shore, on which there is at all times a heavy swell and occasionally blind breakers on the foul ground a league off the land. This treacherous space has been the cause of much loss of life to the early sealers in passing it in their boats.

**RUGGED ISLES** (Raggedy point of the sealers), extending from the north-west point of Stewart island, is a remarkable cluster of high black craggy rocks, worn by a turbulent sea into the most jagged and fantastic shapes. Boats seldom venture inside them, and heavy tide riplings extend some distance to seaward; a depth of 24 to 30 fathoms was carried on rounding them at the distance of from half to one mile, but sailing vessels should not approach within a league of this part of the coast.

**CAVE POINT** is E.N.E.  $3\frac{1}{2}$  miles from Rugged islands; the White rocks lie  $8\frac{1}{2}$  miles N.N.E. from this point; they are a cluster detached from the shore, about 20 feet in height; a league eastward of them is

Black rock point, the north extreme of Stewart island, just westward of it is a remarkable white sand patch ; thence the coast trends E. by S. 5 miles to Saddle point ; this northern portion of the coast is principally a rugged rocky outline with occasional shingle beaches ; mount Anglem and the lofty ridge westward of it sending down their steep spurs to the sea shore.

**TIDES.**—The flood tide coming from the southward strikes the south end of Stewart island and divides, one part running to the northward along its western side, and then to the eastward through Foveaux strait ; the other to the north-east along the south-east side of the island, as far as port Adventure, where they meet again and flow to the eastward. The ebb takes exactly a contrary direction, splitting near port Adventure ; it runs to the north-west through the strait, and down the west side of the island, and to the south-west along the south-east sides as far as the south-west cape.

It is high water full and change days at ports Pegasus and Adventure at 11h. 50m. and 0h. 20m. respectively ; at port William and Paterson inlet at 0h. 45m. and 1h. 10m. ; and Mason's bay at 11h. 10m. : springs rise 8, neaps 6 feet. The strength of the tides off the coast is from  $\frac{1}{2}$  to  $1\frac{1}{2}$  knots, except in the narrow passages ; thus, inside the group of islands off port William and Paterson inlet it runs from one to 3 knots, and in the passage between the south-west cape and Long island, as much as 4 knots during springs.

#### THE SNARES\*

Are a bold and moderately high group of islands, destitute of vegetation, and covered by myriads of the pintado or cape Pigeon ; they lie 62 miles S.S.W. of the south-west end of Stewart island, and extend  $4\frac{1}{2}$  miles in a N.E. by E. and S.W. by W. direction ; they are an excellent landmark from the westward, and are recommended to be made as a point of departure in passing south of Stewart island, whereas the name they bear would deter vessels from approaching them.

The north-east or largest island is little more than one mile in length by half a mile in breadth, rising on the south side perpendicularly to the height of 470 feet ; the north-east side is less precipitous, and probably accessible under very favourable circumstances ; the western portion of the group consists of four islets, separated from the large island by a channel of 2 miles in width. H.M.S. *Chatham*, Lieutenant Broughton, in 1790, ran through this channel, passing a breaking reef of rocks lying in nearly a direct line

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\* See plan on Admiralty chart, Foveaux strait and Stewart Island, No. 2,553. 34323.



between the larger island and the western group, narrowing the channel between the reef and the former to about  $1\frac{1}{4}$  miles.

A depth of 79 fathoms, coral, was found by H.M.S. *Pandora* 2 miles to the north and to the south-east of the large island, deepening seaward in every direction, except in a line towards the Traps rocks, where it gradually decreases to 40 fathoms one mile from the south reef of the latter.

The south-west island is in latitude  $48^{\circ}6'43''$  S., longitude  $166^{\circ}28'40''$  E.; the tides about the group are inconsiderable.

## CHAPTER IX.

WEST COAST OF THE MIDDLE ISLAND, FROM THE WESTERN ENTRANCE  
OF FOVEAUX STRAIT TO CAPE FAREWELL.\*

## VARIATION IN 1875.

Preservation inlet	-	16° 20' E.		Arnott point	15° 55' E.
Cape Foulwind	-	15° 20' E.			

The only places of shelter for shipping along the whole extent of the west coast of the Middle island,—a distance of 500 miles,—are those singular and truly remarkable sounds or inlets which penetrate its south-western shores between the parallels of 44° and 46° south latitude.

The precipitous and iron-bound coast line which forms the sea wall, as it were, in which these extraordinary inlets may be almost likened to so many branches, runs in a N.N.E. and S.S.W. direction; and the whole, thirteen in number, are included within a space of little more than one hundred miles.

With the exception of Cook's excellent description of Dusky bay, (explored during his second voyage in 1773,) nothing has been recorded of this remarkable region; nor, until an examination by H.M.S. *Acheron* in 1851, was it known to any but a few adventurous whalers, whom stress of weather alone had compelled to seek shelter on its desolate and inhospitable shores. The character and feature of these sounds so much resemble each other that it seems desirable to offer a description of them generally before entering into a detailed account of their capabilities individually.

In approaching from seaward there is so much sameness in the appearance of the land, that unless a vessel knows her position accurately, it is not easy at a distance to distinguish the entrance of one sound from another, and the smaller inlets at a distance of 4 or 5 miles have more the appearance of ravines between the high and rugged mountains than the entrances of harbours; in moderately clear weather the coast can be made with confidence, and as the entrances are generally equidistant from each other (about 8 miles), and all running in an easterly direction, there would be little danger to be apprehended from a lee shore; it must be remarked,

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\* See Admiralty charts, Nos. 2,589, 2,590, 2,591, and 2,616, being sheets Nos. 12, 13, 14, and 7 of the coasts of New Zealand; scale,  $m = 0.3$  in.

however, that a fresh or even strong westerly wind in the offing frequently dies away within a mile of the coast, leaving a vessel at the mercy of a calm and swell, when recourse must be had to towing, which probably, in any vessel but a whale ship, would be impracticable; moreover, in consequence of the enormous quantity of fresh water which falls in cascades from the steep mountain ridges, there is always an outset, particularly from the smaller sounds, and frequently a draft of wind down their narrow arms, so that unless with a fresh fair gale, which blows right home and up the sounds, sailing vessels will generally find it a difficult and tedious operation to fetch inside their entrances.

The larger of the sounds are in some measure exempt from these inconveniences; they are generally divided into several arms, penetrating the coast, in some instances for a distance of 20 miles, with a breadth rarely exceeding one mile, and studded with numerous islets. The smaller sounds generally run in for a distance of from 6 to 8 miles, with a width of about half a mile, and anchorage is seldom to be found except at their inner extremes.

The shores, which rise almost perpendicularly from the water's edge, are in the immediate neighbourhood of the sounds covered with trees suitable for all purposes; among them the red pine, which, although heavier and inferior to the kauri, is well adapted for masts, and a vessel requiring spars could procure them of any size, up to a sloop of war's lower mast, with little difficulty; for this purpose the southern inlets are preferable.

The most remarkable feature, common to the whole, is their great depth of water. Soundings can rarely be obtained under 80 or 100 fathoms, and frequently at much greater depths; and the shores, within a few yards, are quite steep-to. Vessels may frequently with advantage warp up by laying out lines to the shore; and when a cove is reached where an anchor may be dropped, it will generally be necessary to secure to the trees also, to prevent being drifted off the steep bank by a flaw of wind. These flaws or squalls frequently blow with great violence off the high land, or down the gulleys, during heavy gales outside.

At the entrance of several of the sounds, a narrow bar or belt of soundings from 30 to 50 fathoms will be found to extend across, where, under favourable circumstances, a vessel may drop a kedge with a hawser, and thus prevent being carried out with the ebb tide; the outset causes the influence of the flood to be but little felt.

Daylight is the best time for leaving these anchorages, when a land wind prevails for a few hours; indeed, unless the wind is blowing directly in, a vessel will seldom have any difficulty in getting to sea. Near the coast a constant current of nearly one mile an hour sets to the south-west.

The prevailing winds on this coast are from north-west to south-west, the former frequently bring rain and thick weather, and as the shore is approached generally veer to the northward; south-west winds are fine and clear; rain is of very frequent occurrence, and often lasts for several days together without intermission; and enclosed as these inlets are by mountains of such stupendous magnitude, except for about two hours before and after noon, the sun is rarely visible; indeed, it would be difficult to find an acre of level land in any part, and that an almost impenetrable forest.

Excellent fish of several kinds are abundant, and may be caught with hook and line close to the rocks at the entrances, or wherever there is a shoal patch; crayfish abound in the southern ports, also several species of ducks, pigeon, and the weka or wood-hen; those rare birds, the ka-ka-po and kiwi, so eagerly sought after by naturalists, and peculiar only to New Zealand, were found here in considerable numbers; no inhabitants have been met with since the few stragglers seen by Cook.

The sand-flies noticed by Cook are of a most virulent kind, and it was with great difficulty that the necessary astronomical observations on shore could be made by the officers of H.M.S. *Acheron*, who were frequently compelled to take refuge from their torments among the thick foliage a short distance from the beach, where, strange to say, they do not penetrate; these plagues invariably left the vessels at dusk, and did not reappear until the following daylight.

The foregoing brief description may be appropriately closed by the following extract from the journal of Commander (now Admiral) G. H. Richards, H.M.S. *Acheron*, engaged in the survey of the coast in 1851:—

“A view of the surrounding country, from the summit of one of the mountains bordering the coast of from 4,000 to 5,000 feet elevation, is perhaps one of the most grand and magnificent spectacles it is possible to imagine; and standing on such an elevation rising over the south side of Caswell sound, Cook’s description of this region was forcibly recalled to mind. He says, ‘a prospect more rude and craggy is rarely to be met with, for inland appeared nothing but the summits of mountains of a stupendous height, and consisting of rocks that are totally barren and naked except where they are covered with snow.’ We could only compare the scene around us as far as the eye could reach, north to Milford-haven, south to Dusky bay, and eastward inland for a distance of 60 miles, to a vast sea of mountains, of every possible variety of shape and ruggedness, the clouds and mist floated far beneath us, and the harbour appeared no more than an insignificant stream; the prospect was most bewildering, and even to a practised eye the possibility of recognizing any particular mountain, as a point in the survey from a future station, seemed almost hopeless.”

**PRESERVATION INLET,\*** the southern of this series of remarkable sounds, lies at the south-west extreme of the Middle island, 80 miles from port William the nearest port of Stewart island, and the same distance from Bluff harbour.

Its entrance lies between Puysegur point and Gulches head, which are  $4\frac{1}{2}$  miles distant from each other in a N.N.W. and S.S.E. direction. The southern point, Puysegur, as before noticed, is a low sloping projection; Gulches head (the dividing point also between Preservation and Chalky inlets) is extremely rugged and clifty, with rocks above water extending 2 cables off, as also a sunken rock, detached and generally breaking, one-third of a mile south of it. Coal island, 850 feet high,  $2\frac{1}{2}$  miles long north and south, and  $1\frac{1}{2}$  miles wide, lies between these two points, and divides the entrance, the northern or main entrance being  $1\frac{1}{2}$  miles in width; the southern is merely a boat channel or refuge for small vessels in case of emergency, and is called Otago Retreat.

**Ballyen Reef** lies off the main entrance, its nearest point bearing S.S.W., three quarters of a mile distant from Gulches head; this reef, partly awash, is  $1\frac{1}{4}$  miles in extent in a south-west and north-east direction, and always breaks heavily; there is a ship channel between it and Gulches head, nearly half a mile in breadth, called Broke-adrift passage, with from 7 to 12 fathoms, irregular rocky bottom; but unless with a fair wind, vessels are not recommended to take it, and they must then be careful to pass outside the sunken rock, one-third of a mile south of Gulches head.

**Table Rock**, a flat rock 20 feet high, lies W.S.W.  $2\frac{1}{4}$  miles from Gulches head, and N.W. by W.  $\frac{1}{2}$  W. one mile from the outer rock of the Ballyen reef; there is deep water close to this rock, and a passage between it and the latter reef.

**APPROACH.**—Coming from the southward or eastward, Preservation inlet will be readily known, as being the first opening seen. From the westward the high white cliffs of Chalky island, at the entrance of the inlet of that name, and 2 miles westward of Gulches head, are an excellent guide; also Treble mount, which reaches an elevation of 3,380 feet, and makes from the westward, with two peaked summits; this mountain is remarkable; it rises from the centre of the peninsula separating Preservation from Chalky inlets, is visible a long distance from seaward, and bears from the main entrance N.N.E. distant 7 miles.

Entering Preservation inlet with a north-west wind it must be remembered that, as the port is approached, this wind always draws to N.N.W., or even more northerly, so that with the current, which sets out and to the southward with considerable strength, a dull sailing vessel will rarely fetch in through the entrance, which lies north-east and south-west. The Ballyen

\* See Admiralty chart, Preservation and Chalky inlets, No. 720, scale,  $m = 1 \cdot 0$ .

reef should therefore be hugged within less than half a mile,—its edge is well defined,—and Gulches head be kept pretty close on board; and, if Coal island cannot be weathered, a vessel should not stand far over towards it, as the outset is very strong on that shore, but keep to the north shore until as high up as Price's beach, which is the first sandy beach one mile above Gulches head; and off which, in Welcome road, a vessel may anchor in north-west winds, in 8 fathoms, three cables from the beach; this, however, is only a stopping place, and with south-east winds, there is always a swell in the outer part of the inlet, until round Cavern head, which bears from Gulches head E.N.E. distant 3 miles.

**Sunken Reef.**—Between Gulches and Cavern heads a bay runs to the northward for  $1\frac{1}{4}$  miles, its sandy beach meeting within half a mile of South port in Chalky inlet; 2 cables within the line of these two heads lies a dangerous reef which does always not break; it bears from the outer end of Price's beach E.N.E. one and four tenths miles from Cavern head W. by S.  $\frac{1}{2}$  S. one mile, and from Spit islet, a high rugged craggy rock connected with the north shore by a sand spit, S. by W.  $\frac{1}{2}$  W. half a mile; there are 17 fathoms close to this reef, and entering with a leading wind a vessel will be well clear of it so long as she does not stand inside the line between Gulches and Cavern heads; in working in there is a passage three-quarters of a mile wide between Pinnacle rock, at the north point of Coal island, and the reef which bears from it N.W.  $\frac{1}{2}$  N., and when Spit island bears north a vessel will be inside it; the depth of water in the outer part of the inlet is from 20 to 16 fathoms until between Cavern head and Coal island, when it increases to 45 fathoms.

**Cavern Head** is a rugged and broken point, on which a swell is always breaking, its summit is a saddle-shaped hill; several rocks above and below water are scattered to the westward of it, and a sunken rock lies  $1\frac{1}{2}$  cables W.S.W. from the extreme; this headland should not be rounded very close, and in working a vessel should not stand so far to the northward as to shut in the southernmost Cording islet with it.

**Cuttle Cove**, the first sheltered anchorage, lies one mile to the northward of Cavern head; after rounding this head the passage up lies between the western shore and Cording islets, and in the narrowest part is scarcely 4 cables in width; the cove will be known by being the third bight above Cavern head, and by a small islet (Single tree islet) lying off it; the anchorage is between this islet and the mainland, in from 10 to 15 fathoms mud, and is snug and well sheltered.

**Cording Islets** are a chain of four islets and some smaller rocks, lying to the north-eastward of Cavern head; there are channels between them through which vessels may pass, if necessary, in working up for Cuttle cove. Vessels so working up should pass to the northward of

the largest Cording islet, at the distance of a cable from its northern point, as a sunken rock lies 2 cables north of that point; but with north-west winds it is recommended to work up to the westward of the islets. In standing to the eastward, between the south Cording islet and Steep-to island, which lies close off the north-east point of Coal island, the Whale rock must be avoided; this rock is awash, with deep water all round it, and bears north distant a quarter of a mile from the north end of Steep-to island.

Round islet and Wood hen island, which lie to the eastward of Cording islets, have no dangers about them but what are visible, and may be approached close.

**Steep-to or Crayfish Island** is a quarter of a mile northward of the north-east end of Coal island, and connected with it by a reef with only 3 feet at low water; a rocky head projecting from its western side affords shelter for a small vessel, which, having entered the port with a strong north-west wind, is unable to work up for Cuttle cove; she should then anchor as close as possible under the rocky head, and about a cable from the shore, in from 10 to 6 fathoms. The reef which connects the two islands is only 2 cables south of the head; she must also be careful not to drop her anchor until soundings are obtained, as the water decreases suddenly from 33 fathoms to 10; this small anchorage, known to the whalers as the Neck of Crayfish island, or Fishing bay, does not afford shelter for more than one vessel, and is not recommended when Cuttle cove can be reached.

**Isthmus Sound.**—The upper part of Preservation inlet, above the Cording islets, branches into several arms. Isthmus sound, the westernmost, runs in a northerly direction 3 miles, with an average width of half a mile; there is a depth of from 45 to 25 fathoms within a quarter of a mile of its head, and in its central part no bottom was found with 56 fathoms. The western side of this sound is a continuation of the coast from Cuttle cove, and vessels may enter it on either side of the Cording islets; if from their western side, the sunken rock, before mentioned as lying to the northward of the largest islet, must be avoided. The head of Isthmus sound is separated from Long sound, to the northward of it, by a narrow neck, a cable across.

**Useless Bay** runs parallel with Isthmus sound, one mile to the eastward, being separated from it by a narrow tongue of land, of which Colt head is the southern extreme; it is in all respects a similar sheet of water, and its head is likewise separated from Long sound by a neck of land two cables across.

**Revolver Bay**, the entrance to which is immediately opposite to Useless bay, runs in a southerly direction for one mile, with a breadth of one-third, and a more moderate depth of water, having anchorage in 12 fathoms a

quarter of a mile from its head. Vessels desiring to enter either of these two bays should steer for Colt head, which bears E.N.E.  $2\frac{3}{4}$  miles from Cavern head; passing to the southward of it, and then standing up the reach to the north-east for three-quarters of a mile, they will be abreast both entrances.

**Long Sound** runs in a north-easterly direction, and extends 14 miles above Colt head. To enter it, having passed that head, and the entrances of Useless and Revolver bays, steer through Narrow bend, which runs to the north-east for 2 miles, as far as Sandy point, on the eastern shore, round which, in Harries bay, there is anchorage in 15 fathoms,  $1\frac{1}{2}$  cables from the beach; from Harries bay the sound opens out to the width of one mile, and takes a north-westerly direction for  $2\frac{1}{2}$  miles, when it resumes its north-easterly trend, and maintains the same width until as high as the Only isles, which lie on the eastern shore; above these it narrows to half a mile, and terminates 3 miles above in Cascade basin, with a very narrow entrance, and a waterfall at the head; in this basin the depth is from 8 to 10 fathoms.

The soundings in Long sound, unless close to the shore on either side, are very deep; 24 fathoms will be found inside the Only isles, where an anchor might be dropped if necessary; on the western shore, three-quarters of a mile above Trevaccon head,—a high cliffy projection, 2 miles above the north-westerly bend,—here is a small cove, which runs to the westward for a quarter of a mile, and nearly a cable in width; here there is a depth of 4 fathoms, and a vessel might haul into it and secure herself. With these exceptions, there is no anchorage in the sound in a convenient depth of water.

**South Entrance of Preservation Inlet,\*** as before observed, lies between the south end of Coal island and Puysegur point, and may be used with advantage by small vessels arriving off Preservation inlet with a strong north-west wind, and not able to work in on account of the current or from other causes. The entrance is narrow, and a sunken reef lying in

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\* The *Otago* schooner, drawing 10 feet water, hired as a tender to H.M.S. *Acheron*, having gained so far to windward as the Balleny reef, was driven to leeward by a strong north-west wind and the prevailing currents, and took refuge in this entrance, securing herself as before described; she thus escaped being carried back through Foveaux strait, a circumstance which had occurred a few weeks previously (before this channel had been examined), when, in consequence of the prevailing westerly winds, she did not regain her port for a fortnight. It is only under such circumstances that a vessel is recommended to run for it.

The north-west winds blow with great violence round this end of the Middle island, and such a heavy sea gets up, that H.M. steam vessel *Acheron* had to put back several times in endeavouring to reach Chalky inlet from Preservation, when a distance gained of one mile would have taken her round the dividing point, Gluches head.



the centre leaves the passage, which is between the reef and the point of Coal island, not more than 2 cables in width. A vessel intending to take this channel must get well to windward before bearing up for it, and then hug the point of Coal island as close as possible—within her own length—and if not able to lay through, should drop her anchor as soon as under the lee of it, in 8 or 9 fathoms, and immediately send out a hawser to the rocks on the island shore; if blowing too hard to warp further up, the end of a chain should be carried on shore and secured to the rocks, when she will lie in perfect safety. In a moderate gale a vessel may warp up by the island shore for half a mile, when good anchorage in 4 fathoms will be found, in perfectly smooth water. A mile within the entrance a bar of sand extends across, with only 6 feet at low water, so that a vessel over that draught must wait for the tide to proceed higher up.

When anchored in one of the snug coves of Preservation inlet, very little idea can be formed of the weather outside, and a boat should always be sent to Cavern head to observe it before putting to sea.

**Tides.**—It is high water, full and change, in Cuttle cove at 11h. 20m.; springs rise 8, neaps 4 feet; the ebb runs out at the rate of about one knot. The flood tide is but little felt in the inlet; it runs to the eastward between Gulches head and the Balleny reef, and sets across the entrance to the south-east.

**Supplies.**—A stream of fresh water runs into Cuttle cove, affording a good supply, and wood may be cut in any quantity. Pine spars may also be procured with much facility a short distance inland, and on the islands. Excellent fish of several kinds are abundant in Preservation inlet, and at the South entrance they may be taken with hook and line in almost incredible quantities. Crayfish also abound in most of the coves.

**CHALKY or DARK CLOUD INLET\*** lies immediately to the north-west of Preservation inlet, being only separated from it, as before remarked, by a high peninsula, of which Gulches head is the southern extreme. Its entrance is well denoted from seaward by the white cliffs of Chalky island, which lies in the centre of it, and also by the lofty mount Treble, rising over its eastern side. Cape Providence, its western entrance point, 300 feet high, lies 5 miles S.S.E. of West cape, and is surrounded by reefs and sunken rocks, which extend from it one mile to the southward.

The main arm of this inlet runs in a N. by E. direction  $8\frac{1}{2}$  miles from the south-east point of Chalky island, with a breadth of nearly  $1\frac{1}{2}$  miles, when it divides; Edwardsons sound continuing the northerly trend for 6 miles further, and Cunaris sound taking an E.N.E. direction for almost the same distance, the eastern head of the latter meeting within little more than one mile of Long sound in Preservation inlet.

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\* See Admiralty chart, Preservation and Chalky inlets, No. 720, scale,  $m = 1\cdot0$ .

The principal anchorages are South port and North port, the former on the eastern side, 4 miles above Gulches head, and the latter on the western, 6 miles within cape Providence. Chalky island and the Passage islands, immediately to the northward, lie in the Middle of the entrance, leaving a wide ship channel on either side of them.

**The Eastern Passage**, between Gulches head and Chalky island, is the most convenient for vessels from the southward; Balleny reef and Table rock, which have been already described in treating of Preservation inlet, lie across the entrance of it, and vessels may enter either by the passage between Gulches head and Balleny reef, or between Chalky island and Table rock; the latter bears S.  $\frac{1}{2}$  W., nearly two miles from the south-east end of Chalky island, and this latter passage is by far the best; it has from 20 to 25 fathoms water, and is entirely free from dangers; there is also a passage between Balleny reef and Table rock, but it has not been closely examined, and is therefore not recommended; when inside the point of Chalky island, the width of the channel is  $1\frac{1}{2}$  miles, and the depth from 60 to 70 fathoms; in working up, vessels should not approach near the north-east end of the island, as Pinnacle rock and several scattered rocks under water extend a quarter of a mile off it. There is a passage between Chalky and the Passage islands, but many rocks are scattered about, and it is by no means recommended.

**The Western Passage**, between cape Providence and Chalky island, is the best for vessels entering from the north-west, as with a wind not to the northward of north-west they would lay through and fetch South port.

In taking this passage, the reefs awash and sunken off cape Providence are the only dangers to be avoided; the former extend south three-quarters of a mile, and the sunken rocks S.W.  $\frac{1}{2}$  S., one mile from the Sugar-loaf rock at the cape Extreme; the cape should therefore be given a berth of  $1\frac{1}{2}$  miles until it bears north, when a vessel may haul up N.E. between the western shore and the islands; steering 3 miles on this course, Return channel will be opened out; this channel lies between the north end of the Passage islands and the south end of Great island,—which forms North port, and is more than half a mile in width, with a depth of 22 fathoms; in rounding the south-east point of Great island care should be taken not to approach it under a quarter of a mile to avoid the Sunk rock. From the north end of Passage islands the entrance to South port bears east, distant 2 miles.

**Sunk Rock**, is a pinnacle rock with five feet on it at low water, and 5 to 9 fathoms close around it, which lies one cable southward of the Seal rock at the south point of Great island.\*

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\* See Admiralty chart:—Foveaux strait to Awarua river, sheet 12, No. 2,589; scale,  $m=0\cdot25$ .

In entering the western channel, an extensive bight, Landing bay, will be seen immediately within cape Providence; there is good landing at its head in north-west winds, and temporary anchorage may be had at its entrance in 9 fathoms, if necessary, but it shoals suddenly within; on the same shore 2 miles above this bay, is Breaker point, the western point of the blind entrance to North port; breakers extend half a mile off it, and vessels should be cautious not to stand up Blind entrance, as there are only a few feet water a short distance within.

**SOUTH PORT** \* is a deep bight, penetrating the eastern shore of the inlet for nearly 2 miles in a S.E. by S. direction, and with a breadth, when inside, of nearly half a mile; the entrance, which is 4 miles above Gulches head, is rendered very narrow by the islets and rocks which lie in it; the narrowest part is less than a cable in width, so that vessels can only enter with a leading wind, or tow in during a calm.

From the western entrance point, two islets (Garden isles) extend in a northerly direction 4 cables, which must be passed to the northward, as there is only a boat channel between them and the south shore; a rock awash lies in the centre of the entrance a long quarter of a mile N.E. by E. from the north point of the outer Garden island; from the north-east point of the inner Garden island shoal water extends to the eastward  $1\frac{1}{2}$  cables, with only 6 feet water at its outer extreme, which is marked by kelp; and from Reef point, the eastern entrance point, a reef of rocks extends towards this 6 feet patch; here is the narrowest part of the channel, and having passed through it about a cable the port opens out to a width of half a mile.

Good shelter will be found in Anchorage cove, on the port hand, immediately within Reef point, in from 14 to 9 fathoms,  $1\frac{1}{2}$  cables from the beach; here vessels may lay in perfect security, and wood and water may be obtained with great facility; above Anchorage cove the port narrows to little more than 3 cables in width, and the water deepens from 15 fathoms to 30 and 36; this depth is carried almost to the head, which is separated from Preservation inlet by a low swampy neck half a mile across, and covered with trees.

Vessels entering Chalky inlet by the eastern channel, intending to anchor in South port, should pass to the northward of Garden islands, at a convenient distance, and also of the other rock awash; having passed the latter, haul up the bay, keeping the eastern shore on board within a cable; on nearing Reef point, look out for the 6 feet patch, which bears W.  $\frac{1}{2}$  N. from it; this may be passed close in 10 fathoms, but if not seen, Reef point must be kept on board within less than a cable until past that bearing; and in hauling into Anchorage bay, the point must not be

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\* See plan on Admiralty chart, Foveaux strait to Awarua river, No. 2,589; scale,  $m=0.25$ .

rounded very close, as shoal water extends for more than a cable to the southward of it.

Vessels entering by the western entrance and bound for South port will, as soon as Return channel is open, make out Stripe head with its jib-shaped patch, on the eastern shore, when a course should be steered midway between it and Garden islands, and as soon as the rock awash in the entrance is passed, proceed as before directed.

**NORTH PORT**,\* on the western side of Chalky inlet, 6 miles above cape Providence, lies between Great island and the main land, which are connected by a bank with only one fathom water from about the centre of the island; the south entrance to this port becomes in consequence a blind one.

Little island lies across the centre of the north entrance to North port; Ship entrance is between its south point and the north end of Great island; the channel is narrow, being little more than half a cable wide, with a depth of 6 and 7 fathoms, the shores on both sides being steep-to; when a cable within the entrance the port opens out to a width of 3 cables, and the anchorage is in the centre, 2 cables from Little island in 14 fathoms, mud bottom, and perfectly land-locked; the port runs to the westward three-quarters of a mile, with a depth of 15 and 18 fathoms water, when it shoals suddenly to 2 fathoms on the bank which connects Great island with the main. Between Little island and the north shore is a boat channel.

North port is easy of access with a leading wind, but the entrance lying in a westerly direction, is opposed to the prevailing winds, and is therefore not so convenient a harbour for sailing vessels as South port, but for a steamer it is certainly preferable.

**Edwardson Sound**, the northern portion of Chalky inlet, is bounded on either side by steep and rugged mountain ranges, from 3,000 to 4,000, feet elevation; the depth of water in its central parts exceeds 100 fathoms, and the shores are steep and free from dangers to the head, which terminates in Lake cove, where there is a moderate depth for anchoring.

**Cunaris Sound**, the north-east arm of Chalky inlet, has an equally great depth of water; its head terminates in two coves, in which from 15 to 24 fathoms will be found.

Small craft harbour islets lie on the south shore, at the junction of the two last-named sounds; a small cove is formed on their southern side, where small vessels may anchor in 8 fathoms, and from 25 to 15 fathoms will be found between them and the south shore in a shingle bay.

**Tides**.—It is high water, full and change, in the ports of Chalky inlet at 11h. 5m.; springs rise 8, neaps 4 feet.

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\* See plan on Admiralty chart, Foveaux strait to Awarua river, No. 2,589.

**WEST CAPE.**—From cape Providence to South point, the south entrance head of Dusky sound, is 13 miles in a N. by W.  $\frac{1}{2}$  W. direction. West cape lies midway between, and projects about half a mile from the general trend. There are no dangers extending any distance from this coast, and vessels may approach it within one mile; at the distance of 2 miles from the shore, a depth of from 40 to 50 fathoms will be found.

**DUSKY SOUND,\*** or bay, as it was named by Cook when he first discovered the opening, lies between Five Fingers point and South point; the width between being 4 miles. In approaching from the southward, Chalky island will be found a good guide to the entrance, as will also West cape, which will appear as a well-defined projecting point of moderate height, dropping a short distance within its extreme, and then rising again with a gradual slope towards the high land.

From the northward Five Fingers point cannot fail to be recognised; it is the south-west extreme of Resolution island, which separates Dusky from Breaksea sound: several high pointed rocks stand off its extreme; these, when viewed from certain situations, give it the appearance of the fingers of a man's hand, from which circumstance it received the name from Cook; as that navigator also observes, "the land about the point is still more remarkable by the little similarity it bears to that adjacent to it, being the extreme of a narrow peninsula, lying N.N.E. and S.S.W. for 7 miles, of a moderate and equal height, and covered with wood."

Dusky sound runs in an E.N.E. direction 22 miles, and is studded with numerous islands and rocks, but has few dangers that are not visible.

**Anchor Island,**  $3\frac{1}{2}$  miles long, rising to an elevation of 1,360 feet, lies immediately within the entrance, in the direction of the sound; and is surrounded by a labyrinth of small islets. A small harbour † on its north side, about the centre of the island, affords secure anchorage, being sheltered from the northward by the Petrel islands, which lie immediately off its entrance. Vessels entering the sound northward of Anchor island with a strong north wind, and unable to work up for Facile harbour, might find it convenient to anchor here; but otherwise it is not recommended, on account of the difficulty of leaving with the prevailing winds: a passage in will be found either to the southward or northward of Petrel islands.

Entering by the southern passage, a vessel may pass on either side Entry island, a small island a quarter of a mile S.E. of the large Petrel island; if to the northward, the south-west end of large Petrel island should be kept close on board, to avoid a sunken rock with 13 feet at low

\* See Admiralty chart, Dusky and Breaksea sounds, No. 719, scale  $m = 1\cdot0$ .

† See plan, Admiralty chart, Foveaux strait to Awarua river, No. 2,589, scale =  $0\cdot25$ .

water, which lies S. by W. one cable from that point; if to the southward of Entry island, that island must also be passed close, to enable a vessel with a northerly wind to weather a rock above water that lies nearly in the middle of the harbour entrance. This rock may however be passed on its south side, if necessary; having passed it, steer south-westerly for the entrance of the harbour, distant little more than a quarter of a mile, and anchor in 16 fathoms, a cable from the shore: the width of the harbour is about one cable. The passage in, to the northward of Petrel islands, is the widest, and with a north wind the best; these islands are bold to, and passing between the large Petrel and the east point of the harbour, take up a berth as before directed. Vancouver's ship, the *Discovery*, rode out a heavy gale from north-west here in safety.

South-westerly winds roll a heavy sea into the entrance of Dusky sound, but is broken by the numerous islands; smooth water is found a short distance within.

The principal anchorages in Dusky sound are, Pickersgill harbour and Cascade cove on the south side, Facile harbour and Duck cove on the north; temporary anchorages may also be found in other parts, but the depth of water in general is very great, and they cannot be recommended unless in case of necessity.

**Directions.**—Vessels entering from the southward with a leading wind should pass about half a mile from the south entrance point, and steer up the sound, keeping that shore on board at about the same distance, passing to the southward of all the islets that lie off Anchor island. Soundings in from 20 to 30 fathoms will be found at the entrance, and until abreast the outer end of the island, when no bottom could be obtained with 80 fathoms line. A reef of rocks above water, or awash, extends one-third of a mile off the south shore, nearly 3 miles within South point, just above two small islets on that shore. The first indentation seen is Shelter cove, three-quarters of a mile above this reef; it is only fit for boats.

**Pickersgill Harbour\*** is  $5\frac{1}{2}$  miles above the south entrance point, and immediately abreast the west end of Indian island, the latter is  $1\frac{1}{2}$  miles in length, lying in the direction of the sound, and half a mile from the south shore. Crayfish island lies across the entrance of the harbour. The narrow passage in, by which Cook entered, is that westward of this island, but the best channel, nearly a cable in width, is to the eastward, avoiding a half tide rock which lies a short distance from the shore of the main land, and bears S.S.E. from the east end of Crayfish island; by keeping the island close on board, this rock will be cleared, and when within, anchorage may be had in 15 fathoms, a cable from the shore.

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\* See plan of Pickersgill harbour, on Admiralty chart, Foveaux strait to Awarua river, No. 2,589; scale,  $m = 0.25$ .

Wood and water may be procured here with much facility, and though a confined anchorage, Cook considered it not inferior to any other in the sound for two or three vessels.

**Cascade Cove** is three-quarters of a mile above Pickersgill harbour, and has two small islands lying off its entrance; S.E. from their south end, midway between them and the shore, is a rock awash; the cove is one-third of a mile in width at its entrance, with a depth of 26 fathoms, and runs  $1\frac{1}{2}$  miles in a S.W.  $\frac{1}{2}$  S. direction;  $\frac{3}{4}$  of a mile from its entrance, a sandy point projecting from the southern shore narrows it to less than 2 cables, but it opens out again above, and good anchorage may be had in from 12 to 15 fathoms for several vessels; the head of the cove terminates in a sandy beach, which dries for some distance at low water, and through which flows a considerable stream; the cascade from which this anchorage received its name is on the eastern side of the entrance.

Immediately above Indian island are Long and Cooper islands: these three islands form a chain extending nearly to the head of the sound, with a navigable channel both north and south of them. Long island is 7 miles in length, with an average width of about one mile, tapering at either extreme; its west end is almost connected with the eastern extreme of Indian island by a chain of islets and rocks with no ship channel between; Cooper island is  $3\frac{1}{2}$  miles in length, with a channel between it and the east end of Long island of  $2\frac{1}{2}$  cables in breadth, and a depth of 36 fathoms.

To sail up the sound to the south of these islands, vessels after passing Pickersgill harbour should keep to the southward of the two small islands off Cascade cove; above these islets the channel becomes narrow, in some places not more than 2 cables wide, the depth of water ranging from 35 to 70 fathoms; in consequence of this, and the high range of almost perpendicular mountains which extend in one unbroken line along the southern side of the sound, the navigation for a sailing vessel would generally be found tedious and difficult; as the east end of Long island is approached, the channel increases in width to nearly three-quarters of a mile, and continues so until advanced half way along the coast of Cooper island, when a cove will be seen on the southern shore, but with a depth of water too great for anchorage; above this cove the channel again narrows, and between the east end of Cooper island and the south shore is not more than 120 yards across, with rocks extending from the island shore; the sound extends for  $3\frac{1}{2}$  miles above Cooper island, with a breadth of half a mile, and terminates in two coves, in the northernmost of which anchorage may be had in 12 fathoms, a cable from the sandy beach at its head, through which flow two large and rapid streams.

**Facile Harbour**,\* on the north side of Dusky sound, is a deep water

\* See plan of Facile harbour, on Admiralty chart, Foveaux strait to Awarua river, No. 2,589; scale,  $m = 0.25$ .

anchorage, formed between Parrot and Pigeon islands and the eastern shore of the main, its entrance bearing N.E. by N.  $4\frac{1}{2}$  miles from Five Fingers point; Cook recommends this harbour for vessels bound to the southward, and undoubtedly they would get easier to sea, with a northerly or north-west wind, than from the ports on the southern side.

In entering the sound between Five Fingers point and Anchor island there is a clear working width of  $1\frac{1}{4}$  miles without dangers, the depth of water from 50 to 90 fathoms; vessels bound for Facile harbour with a leading wind, after rounding Five Fingers point, should keep the northern shore on board within half a mile until abreast Parrot island 4 miles from the point; when the northern end of this island is rounded the entrance of the harbour will bear east, distant  $1\frac{1}{4}$  miles; it lies in the north-east bight of the bay, and is somewhat less than a cable in width, with a small islet on either side; there is safe anchorage within, in from 15 to 33 fathoms, and a snug cove in the north-east corner, where the remains of a large ship still exist. In leaving Facile harbour, it will often be convenient with westerly winds to pass between Parrot and Pigeon islands; the channel is scarcely a cable wide, with a depth of from 5 to 9 fathoms in the narrowest part; between Pigeon island and the main land there is only a boat channel.

In the bight northward of Facile harbour are Cormorant and Goose coves, the former has an easterly trend, and is a snug anchorage with a moderate depth; Goose cove is a shallow tidal estuary, and is separated by a low narrow neck from the head of Wood Hen cove, on the sea face of Resolution island.

**Duck Cove\*** is easy of access, and is a convenient anchorage for vessels under any circumstances; it lies on the north side of the sound  $3\frac{1}{4}$  miles N.E.  $\frac{1}{4}$  N. from the north end of Indian island, is a quarter of a mile in width at its entrance, and runs in a N. by W. direction three-quarters of a mile, narrowing towards its head to a cable; mountains rise on either side to elevations of nearly 3,000 feet separated by a valley at its head, through which a large stream runs into the cove. H.M.S. *Acheron's* anchorage was in 11 fathoms,  $1\frac{1}{2}$  cables from a boulder beach on the eastern shore, and half a mile within the entrance.

Vessels bound for Duck cove, and entering Dusky sound by the southern passage, should keep the south shore on board, as before directed, until reaching Indian island, and after passing a convenient distance along its north side, steer N.E. for the entrance of the cove, where soundings in 30 fathoms will be found, which decrease gradually to 15 and 10 at its head.

If entering from the northward, after passing Anchor island, steer

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\* See plan of Duck cove, on Admiralty chart, No. 2,589, scale  $m = 0.25$ .  
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through the channel between its eastern end and the main land ; there are no dangers in it but what are visible. Leave Useless islands on the port hand, and pass mid-channel between them and the south-east point of Anchor island, avoiding the Seal rocks awash, which lie S.E. by E. one-quarter of a mile from the latter point ; as soon as these are passed steer over towards the eastern end of Indian island, or S.E. by E. until the sound above opens out, when haul up north-east along the north shore, and enter the cove, as before directed. A small cove will be seen immediately to the westward of Duck cove, with an islet at its entrance, but it is too small to afford anchorage.

Close off the outer east point of Duck cove, which is a prominent point, stands the Porpoise rock, and E.S.E. from it, distant three-quarters of a mile, on the north coast of Long island, is Detention cove, a small nook, where Cook found temporary anchorage in 14 fathoms ; from here the sound runs in a north-east direction, with depths varying from 120 to 160 fathoms ; 3 miles above Porpoise rock is the entrance of the arm which leads into Breaksea sound ; two small islets lie immediately abreast this entrance, borrowing on the Long island shore ; within them is a rock awash ; 2 miles above, and in mid-channel, is another small group, Shag isles, from whence the sound continues clear in a E.N.E. direction along the north shore of Cooper island to its head, maintaining an average width of two-thirds of a mile, with a great depth of water.

**Acheron passage**, the arm connecting Dusky and Breaksea sounds, runs in a N. by W. direction 8 miles, with an average width of half a mile, and is formed by the eastern shores of Resolution island and the main land. High, precipitous, and wooded mountains rise on either side to heights varying from 3,000 to 4,000 feet. Soundings were only obtained in the middle of the channel at depths of 200 fathoms, and so perpendicular are the shores that 80 fathoms were found within a few feet of them. There are, however, two or three places where an anchor may be dropped if necessary.

The first of these temporary anchorages is in a small sandy bight close within Passage point, the eastern entrance of the arm ; here a depth of 13 fathoms will be found, but, being open to a long reach of the sound to the southward, it is exposed to south-west winds, and is therefore not recommended when any other can be obtained. The second is on Resolution island, in a bight  $2\frac{1}{2}$  miles northward of Passage point, and bearing S.W. by S. from the south entrance point of Wet Jacket sound. Here from 9 to 12 fathoms will be found, and a vessel may secure to the trees.

**Wet Jacket Sound** is a deep indentation penetrating the eastern shore of the arm for a distance of 6 miles in a E.N.E. direction, with a width generally not exceeding one-third of a mile. Anchorage may be obtained at its head in from 18 to 10 fathoms, but in other parts it is very deep.

The next anchorage is in Occasional cove, on Resolution island, near the north entrance of the arm, 3 miles from Wet Jacket sound; here Cook anchored in 16 fathoms, and moored with a hawser to the shore; the entrance of Breaksea sound is just shut in from this anchorage.

**OUTER COAST of RESOLUTION ISLAND.**—Returning now to Five Fingers point and proceeding northwards, the outer coast of Resolution island trends N.N.E., and is somewhat remarkable, as before observed, from being lower than the neighbouring land. Two miles northward of the point, and a quarter of a mile from the shore, stands a small islet, 70 feet high; nearly half a mile from this islet, in a S.W.  $\frac{1}{2}$  S. direction, is a smaller rock and reef, and half a mile farther in the same direction a rock which occasionally breaks. These latter dangers extend more than half a mile from the shore, which should not be approached here within half a league. The coast line is now nearly straight to Wood Hen cove, a distance of 9 miles from Five Fingers point; this exposed cove is nearly one mile in length, with a width of about a cable, and only shelters boats; from it the coasts rounds away north-east towards the entrance of Breaksea sound.

**BREAKSEA SOUND**, which is noticed by Cook,—who did not explore it to its head,—as the northern entrance of Dusky bay, in consequence of his having passed to sea through it by the arm which connects the two, already described, has been considered of sufficient extent to demand a distinctive appellation; it has therefore received the name of Breaksea, from the island at its entrance, which was named by that great navigator himself. This island which is about 3 miles in circumference, and considerably lower than the land of the main, lies N.N.E. 12 miles from Five Fingers point; the entrance of the sound being rather narrow, and surrounded by very high land on either side, is not easily distinguished until within a few miles, when Breaksea island and the smaller islets which lie on the south side of the entrance will be readily made out; coming in from seaward also, it is remarkable from the comparatively low land to the southward, the first craggy mountains north of Five Fingers point rising over its south side.

There is a passage in on either side of Breaksea island; that to the northward is the best, being one mile in width, and entirely free from dangers. If the south channel is taken a vessel should pass to the southward of three small islands south of Breaksea island, between them and Gilbert islands; this passage is not more than half a mile in width. There is a passage between Breaksea island and the three small islands, but it is not recommended, as a long reef extends from the south side of the former island, rendering it very narrow.

Gilbert islands are two distinct groups, more than half a mile apart,

extending off the south entrance point of the sound, with an apparently deep bight between them, but which offers no shelter and is much exposed. The only anchorage among these islands is Stevens cove, a small place, with a depth of 4 fathoms, sufficient only to hold one vessel of moderate tonnage by securing to the trees, and where sand flies are so numerous that it is scarcely possible to remain on board during the day : this cove is on the main land, just within the eastern group of islands, and to enter it a vessel should pass between the two easternmost of them.

One mile above the eastern Gilbert island, in the middle of the sound, is Entry island. From it the arm leading into Dusky sound runs in a S.S.E. direction, and the main arm of Breaksea sound to the north-east for 8 miles, when it divides into two arms, one continuing the north-easterly direction 6 miles farther, while the other runs easterly for the same distance ; the depth of water in both is very great. Half a mile above Entry island 210 fathoms were obtained, and 3 miles above, under a high cliff on the north shore, no less than 284 fathoms ; in the arms it is scarcely less, until at their very extremes, where alone anchorage may be had.

The best anchorage in Breaksea sound is on the south side,  $2\frac{1}{2}$  miles above Entry island, inside the Harbour islands, which extend for 3 miles along that shore. H.M.S. *Acheron* anchored in 12 fathoms, off a sandy beach, between the first or outermost Harbour island and the main land, and found excellent shelter ; this anchorage may be entered either to the southward of the first island, or round the north end of the second island, which latter is the widest and best passage. Within the islands above this, the water is too deep for anchorage.

There are three coves called First, Second, and Third coves, on the north side of the sound, but the water in them is also inconveniently deep for anchorage.

**Tides.**—It is high water, full and change, at Duck cove in Dusky sound, at 10h. 50m. ; springs rise 10, neaps 6 feet.

**DAGGS SOUND.\***—From Breaksea island to the entrance of Dags

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\* A remarkable scene occurred during our stay in this sound. Our anchorage was at the head of the northern arm, a cable's length from the shore, in 12 fathoms: the change of the moon brought a N.W. gale, with heavy rain, and in the course of a few hours no less than fourteen magnificent cascades were pouring down the steep sides of the mountains (upwards of 3,000 feet high), by which we were surrounded, bringing with them trees of considerable size, and all other obstructions met with in their passage. The effect was as if a heavy surf were breaking round the vessel ; the mist, floating as low as our mast-heads, occasionally obscured everything but the summit of the mountains and the foam below, and produced altogether a scene as grand as it is possible to conceive, which lasted without abating in any degree for two days, when the water alongside, which had been as salt as the ocean, was for a considerable depth below the surface perfectly fresh.—Remark Book of Commander G. H. Richards, H.M.S. *Acheron*, 1851.

sound is 12 miles, the intervening coast, running in a N. by E. direction, is steep and cliffy, overlooked by high mountain ranges; about midway between, a slight indentation of the coast line occurs, and a break in the mountains will be observed, through which flows Coal river. Between Breaksea sound and this river some high black rocks stand, one-third of a mile from the shore, as also smaller scattered rocks nearly the same distance off the projecting points. From the south entrance point of the sound, a cluster of rocks will be seen extending a quarter of a mile off, and one mile north of the north entrance head is a remarkable rocky peninsula point.

The width of the entrance is one mile, which shortly decreases within to 4 cables; the general trend of the sound is E. by S. for nearly 5 miles, when it branches into two arms, one taking a N. by W. direction for 2 miles, and the other running south-easterly the same distance. In the entrance and for  $1\frac{1}{4}$  miles within the heads, soundings will be found in from 20 to 30 fathoms, sand bottom, but as soon as the channel narrows, the depth increases to 70 and 90 fathoms. An unusual feature in these sounds occurs here, in a bank nearly in mid-channel, with 4 fathoms at low water and deep water all round; it lies  $2\frac{1}{4}$  miles within the north entrance point, and half a mile above where the channel begins to narrow, rather on the north shore. Anchorage may be obtained at the head of the north arm, in from 12 to 18 fathoms, 2 cables from a stony beach, with several streams of fresh water running through it.

The head of this arm communicates, within little more than one mile, of a similar one in Doubtful inlet, the land separating them being remarkably flat for this country, and thickly wooded. The south-east arm, after running two miles in that direction, turns sharply to the north-east, and terminates in Jacob's creek, very narrow, with from 8 to 12 fathoms in it.

**DOUBTFUL INLET.**—The entrance of this extensive inlet lies 7 miles N. by E. from Daggs sound, the intervening coast being of the same character as that to the southward; the depth of water at the distance of one mile from the shore was found to be 188 fathoms; its entrance more, than 2 miles in width, with high mountains rising on either side, presents a wide opening to seaward, and will be clearly distinguished from a long distance. Allround peak, and mount Groznoz, on its northern side, from 4,000 to 5,000 feet elevation, are very striking; on a nearer approach Nea islets will be seen extending to the southward from the north entrance head, and from the south entrance point two remarkable peaked rocks, the Hare's Ears, lie at a distance of 3 cables.

The general trend of Doubtful inlet is E. by S.  $\frac{1}{2}$  S. for 17 miles, with three arms on its south side extending from 3 to 4 miles in a southerly direction; the north side of the inlet is formed by Secretary island,

extending 10 miles in a north and south direction, and 5 miles in its widest part; this island separates the entrance of Doubtful inlet from Thompson sound, which are connected by a short arm 8 miles within the entrance of the former.

Nea islets, extending in a south-east direction nearly one mile from the north head, and Hare's Ears rocks from the southern, contract the entrance of Doubtful inlet to a width of little more than  $1\frac{1}{4}$  miles, with a depth of from 50 to 60 fathoms; and on entering, a reef awash will be seen extending a quarter of a mile S.W. by S. from the northern Nea islet.

Two miles within the entrance, Bauza island, 3 miles in length, lies in the middle of the channel; there is deep water on either side, but the Gaol passage on its south side is the best; the average width of this passage is somewhat less than half a mile, but no soundings were obtained in it at the depth of 80 fathoms; northward of Bauza island, the channel at its eastern end is not more than a cable across, and the winds in it will generally be found unsteady.

From the outer or north-west end of Bauza island a rocky group,—Shelter islands,—extend in a north-westerly direction in two parallel lines, with a passage between them of  $1\frac{1}{2}$  cables in width, and a depth of 12 fathoms; at the south-east end of the northernmost cluster small craft moor in 10 fathoms between the islets; there is a passage between Shelter islands and the northern shore of the inlet, as also between them and Bauza island, but large vessels are recommended to take the Gaol passage in preference.

On the north shore,  $1\frac{1}{2}$  miles above Flurry head, (the east point of Bauza island,) is a small anchorage in Blanket bay,  $1\frac{1}{2}$  miles eastward of which is Common head, the south-eastern extreme of Secretary island; between it and Wood head, a mile to the south-east, is the passage leading into Thompsons inlet to the northward; this passage is three-quarters of a mile across, and has two small islets rather on its eastern shore.

On the south side of Doubtful inlet, one mile above Flurry head, is the First arm, running in a south-westerly direction nearly 3 miles, with an average width of 3 cables and a depth of from 30 to 50 fathoms; anchorage may be had in Snug cove at its head in 12 fathoms, a quarter of a mile from the beach. Smith sound, the main branch of the inlet above First arm, continues the E.S.E. trend, with an average breadth of  $1\frac{1}{4}$  miles, and having no soundings in its centre at a depth of 120 fathoms; on either side close to the shores there are in places from 17 to 25 fathoms, but no spot where a vessel could drop an anchor.

Crooked arm on the south shore, 4 miles above First arm, runs in a southerly direction  $2\frac{1}{2}$  miles, when it turns sharp to the W.S.W. for an equal distance; the turning point has a high precipice on either side; the

breadth of this arm is half a mile, except at the turn, where it is somewhat less, and in Haul-ashore cove, at its head, there is anchorage in 12 fathoms within 3 cables of the beach, through which flow large streams.

Above Crooked arm the sound trends slightly more to the southward, and its width is contracted to half a mile; on the north shore,  $3\frac{1}{2}$  miles above, is a solitary mountain cone, which looking up the inlet from seaward appears very remarkable; a small round islet lies in the centre of the channel abreast this cone, and immediately above it on the north shore is Elizabeth island, with a channel on either side; a mile above Elizabeth island, on the same shore, is Deep cove; its northern side a steep precipice; with the Lyvia river running into its head; there is no anchorage in this cove. Rolla island, a small round islet, lies off its south entrance point, and from here Halls arm runs in a S.S.W. direction 4 miles; its entrance, which is one mile above Rolla island, lies between a high steep cliff on the western shore and a clifly peninsula point on the eastern; N.W. by N. 2 cables from the latter point is a reef awash; the width between the two entrance points is only a quarter of a mile, but within it opens out to three-quarters of a mile, with a long beach of sand and shingle on the eastern shore, a cable from which there is no bottom with 70 fathoms; above this beach the arm narrows gradually to its head, which reaches within 2 miles of an arm of Breaksea sound.

The general depth of water in Doubtful inlet is very great; in the main arm soundings were rarely obtained under 120 fathoms, and in the smaller branches from 40 to 70 fathoms; the anchorages are few and not easily found by sailing vessels, with the exception of the small craft anchorage between Shelter islands, that in Blanket bay, and at the heads of the First and Crooked arms, there is no place where a vessel could find shelter in a moderate depth of water.

**THOMPSON SOUND.**—The western shore of Secretary island, which forms the coast line between Doubtful and Thompson sounds, is almost straight and runs in a N.N.W. direction for 8 miles to Colonial head, the north extreme of the island and south entrance point of the inlet; at the distance of little more than one mile from this coast no soundings were obtained at a depth of 300 fathoms.

The main arm of this sound has a general trend of S.E. for 10 miles to its junction with Doubtful inlet, when it turns to the N.E. by E. for a further distance of 8 miles, and thence S.E. 4 miles. The entrance is only half a mile in width, but is perfectly free from dangers, with a depth of 75 fathoms. For the first  $1\frac{1}{2}$  miles it runs in a south-east direction, at which distance Open cove will be seen on the east shore; from 15 to 20 fathoms will be found in this cove, but it is exposed to north-west winds:

2 miles southward of Open cove is a projecting peninsula, with a deep indentation on either side of it. Neck cove, on the north, has several rocks in it and is open and exposed.

**Deas Cove,\*** on its south side, though small, is a secure and sheltered anchorage; it lies in a N. by E. direction for 3 cables, with a width less than one cable; the depth of water is from 6 to 16 fathoms. On the west shore the cliffs are steep-to; the eastern shore shoals for a short distance off. H.M.S. *Acheron's* anchorage was in 10 fathoms, rather on the west shore, a cable from the sandy beach at the head, secured also by hawsers to the shore; this is the only convenient anchorage in Thompsons inlet.

From Deas cove the inlet resumes its south-easterly trend, with an average width of three-quarters of a mile as far as Common head; the depth of water is very great; just above Deas cove, in mid-channel, soundings were obtained in 250 fathoms, mud bottom.

Bradshaw sound, a continuous arm running N.E. by E. 8 miles, is similar in feature to the outer part of the inlet. McDonald island lies close off its north shore  $1\frac{1}{2}$  miles from the head, and in the bay immediately to the westward there is anchorage in 10 fathoms a quarter of a mile from the shore. Precipice cove which forms the head of the sound above McDonald island is bounded on either side by high perpendicular cliffs; in the middle there is no bottom at 120 fathoms, but very close to its head, which terminates in a river, there is 10 fathoms; from abreast McDonald cove, Gaer arm runs to the south-east 4 miles, with three low islands at its head, outside which it dries at low water: the soundings in this arm are from 40 to 20 fathoms, and anchorage may be had in Shoal cove at its head, in from 14 to 6 fathoms, at a distance of half a mile from the islands.

**TIDE.**—It is high water on full and change in Deas cove at 11h. 30m.; springs rise 8, neaps 6 feet.

**NANCY SOUND.**—The entrance of this sound is 3 miles from Thompson sound, and is well denoted by Turn peak, a conspicuous sharp-peaked mountain rising over its northern side to an elevation of 4,120 feet; this peak will be distinguished from a long distance seaward, and presents the same appearance viewed from any point. When within 5 or 6 miles of the port a remarkable reddish coloured patch, caused by a land slip, will be seen on the high land immediately northward of the entrance, also a white patch on the lower part of the cliffs both north and south of the heads, produced by a similar cause; two ragged islets project to seaward from the south entrance point 2 cables, and Entrance islet, a flat-topped rock, 50 feet high,

\* See plan of Deas cove, on Admiralty chart, Foveaux strait to Awarua river No. 2,589, scale  $m = 0.25$

lies off the north entrance point; the channel in is to the southward of this rock, and is not more than 3 cables in width, with a depth of 30 fathoms.

There is a channel northward of Entrance islet, but a sunken rock lies in the middle, and although the depth of water is sufficient, it is only adapted for boats; the bank of soundings, common to most of these sounds, extends across the mouth of this, with from 30 to 40 fathoms water, but does not continue sufficiently far within to enable vessels to take advantage of it for anchoring.

The trend of Nancy sound on entering is E.  $\frac{1}{2}$  S. for  $1\frac{1}{4}$  miles, when it expands to a width of three-quarters of a mile, and runs in a south-easterly direction nearly 5 miles, gradually decreasing in width to  $3\frac{1}{2}$  cables, the soundings from 130 to 90 fathoms, and the shores steep-to on either side. A small islet lies close off Bend point, the upper north point of this arm; half a mile S. by W.  $\frac{1}{2}$  W. from this islet anchorage in 15 fathoms will be found, in Heel cove, a hundred yards from the stony beach; from here the sound turns abruptly to the N.E. by E. for a distance of 2 miles, with a width of  $3\frac{1}{2}$  cables, and terminates in a stony beach, where anchorage may also be had close to the shore; the soundings in this latter arm are from 70 to 30 fathoms.

**CHARLES SOUND** is 4 miles to the N.N.E. of Nancy sound, with a straight coast between, on which are one or two boulder beaches; at the distance of little more than one mile from the entrance no bottom was found at the depth of 230 fathoms. Turn peak, just noticed, rising midway between it and Nancy sound, serves as a good guide to the entrance; from the points to the northward several scattered rocks extend, and one rather remarkable from being detached, will be seen a quarter of a mile from the shore.

The trend of Charles sound for 4 miles is S.E., with a width of half a mile; the depths at the entrance are from 38 to 55 fathoms, increasing within to 110 fathoms. Three miles from the entrance, close to the north shore, is a small islet, with a cove within, but the shores are steep and rocky, and it is exposed and too small for anchorage; there is good landing for boats on the upper side of the islet; one mile above the islet the sound divides into two arms, one running E. by N. 3 miles, the other S.S.E. for the same distance; the average width of these arms is 3 cables, and their depth from 30 to 50 fathoms.

Eleanor island lies at the entrance of the eastern arm, and has a deep-water channel on either side. Near the head of the southern arm are two small groups of low islands, with three rocks above water to the eastward of the first group; these rocks, as also the islets, must be passed on their eastern sides, and anchorage may be obtained above the rocks in from 14



to 20 fathoms. Vessels, however, are not recommended to run for Charles sound; there is no convenient anchorage, and the sounds on either side of it are to be preferred.

**CASWELL SOUND.**—The coast line between Charles and Caswell sounds, a distance of little more than 3 miles, is extremely rugged, with a ridge of high rocks extending from the shore for 3 cables midway between. Unlike any other part of this coast, the water is shoal for a short distance off, with irregular bottom. From 20 to 30 fathoms will be found at the distance of half a mile, but even under favourable circumstances, vessels should not approach nearer than one mile.

The entrance of Caswell sound is narrowed by an island detached from the south head, with a small reef awash off its north end, leaving a passage between it and the north entrance head of  $3\frac{1}{2}$  cables in width. To the southward of the island is a boat channel, with a sunken rock in its outer entrance. A narrow belt of comparatively shoal water extends partly across the entrance half a mile outside the island, with from 20 to 40 fathoms on it, but immediately within no bottom is found at the depth of 120 fathoms.

The trend of the sound is S.E.  $\frac{1}{2}$  S. for  $1\frac{3}{4}$  miles from the north head when it turns to the eastward, and increases to the width of one mile;  $2\frac{1}{2}$  miles within the entrance, on the south side, is a projection,—Dog point,—from whence the sound runs E.S.E. for a further distance of  $2\frac{1}{2}$  miles, narrowing gradually to a width of half a mile. The shores are very steep on either side, 100 fathoms being obtained within a cable, but in mid-channel no bottom at 130 fathoms.

Close to the north shore at the head of the reach, which runs E.S.E., is the Boat rock, just awash at high water; a shoal patch of sand extends round this rock, on which, just above the rock, a vessel may drop her anchor in 4 fathoms if necessary, but it is very steep. From hence the sound runs easterly 3 miles, and the best anchorage is  $1\frac{1}{2}$  miles above Boat rock, in a small bight to the eastward of a wooded islet, just detached from the north shore. Here there are 12 fathoms, but the bank is so steep that a stout hawser should be carried to the trees on the east point of the cove, to prevent being driven off by a flaw of wind from the high land. The general depth of water in the sound, above Boat rock, is from 80 to 20 fathoms; at its head is a shallow flat.

**GEORGE SOUND.**—From the north head of Caswell sound, a steep and iron-bound coast line, broken only by two small bights,—Two Thumb and Looking Glass bays,—trends N.N.E.  $\frac{1}{2}$  E. towards George sound, the entrance of which is distant 13 miles. Two Thumb bay, 3 miles north of Caswell sound, is a mere indentation of the coast, strewed with rocks which also front the shore for 3 miles to the northward, or as far as

Looking Glass bay. The latter bay penetrates the coast in an easterly direction one mile, and is a quarter of a mile in width at its entrance, but wider within; the depth of water is from 9 to 7 fathoms, sand bottom, with a round beach at its head, composed of large boulder stones; it is quite open to the westward.

The Houserook, a remarkable rock of that shape a short distance off shore, is  $2\frac{1}{2}$  miles northward of Looking Glass bay; from it the coast trends slightly more to the eastward, broken with shingle beaches, for 4 miles to the entrance of George sound. No bottom was obtained at the distance of one mile from this stretch of coast just described at the depth of 100 fathoms, except abreast Houserook rock, where soundings were struck in 72 fathoms, rocky bottom.

The first reach of George sound runs S.E.  $\frac{1}{2}$  S. 7 miles, is nearly one mile wide at the entrance, and preserves that width as far up as the anchorage, a distance of 6 miles. Twenty-two fathoms were found half a mile off the south head, but rapidly deepening within to 50, 80, and 106 fathoms. With the exception of two small rocky islets on the eastern side, 2 miles within the entrance, and a rock awash one mile within the south head, nearly a cable from the western side, the shores are free from danger, and this sound is easier of access and egress than most of the others, in consequence of its greater width, and the winds generally blowing with more steadiness up and down it.

**Anchorage Cove.**—There is good anchorage in 15 fathoms in Anchorage cove on the north shore, nearly at the head of the first reach. With north-west gales a swell sets in, but by hauling over to the north shore and securing to the trees a vessel will lie in smooth water. The head of this cove is a sandy beach, through which flows a rapid river, with 2 feet on its bar at low water. One mile above the sound trends to the E.S.E. for 3 miles, and then sends off two arms to the south-east and south-west, the latter extending nearly 3 miles, and the former  $1\frac{1}{2}$ , with an islet towards the head of each. At the head of the south-east arm is a small cove or basin, and about 200 feet above the level of the sea is an extensive lake, whose superfluous waters run into it by an easy descent down the mountain side, causing a considerable outset in the harbour. The depth of water in the upper arms varies from 40 to 14 fathoms.

George sound is surrounded by mountains of the most rugged and precipitous character; a very striking one rises over its western side 3 miles above the entrance to an elevation of 4,775 feet, and a range still more striking and perpendicular on either side of its head to nearly 5,000 feet.

**BLIGH SOUND** is nearly 6 miles N.E. by N. from George sound, the

intervening coast being cliffy, slightly indented, and of the same general character as that already described. Two remarkable mountains, 3 miles within the north entrance point, mount Longsight and Table mountain, the former 4,600 feet in elevation, will serve to point out the entrance from a long distance seaward in clear weather.

This sound has three reaches, the outer, which is 2 miles in width at its entrance, runs S.E. by E.  $3\frac{3}{4}$  miles, and narrows gradually to Turn-round or entrance point of the second reach, where it is only 2 cables across. The depth of water between the heads is from 30 to 40 fathoms, deepening rapidly within as the channel narrows. From Turn-round point the second reach turns sharply to the S.S.W., and runs in that direction  $4\frac{1}{2}$  miles, with an average width of half a mile and a depth of 70 to 80 fathoms. On the eastern shore of this reach, three quarters of a mile from its head, is Amazon cove, a small craft anchorage; above it, the Third arm or Bounty haven turns sharp again to the S.S.E., carrying a width of 4 cables for  $1\frac{1}{2}$  miles to its head, where there is good anchorage in 12 fathoms close to a stony flat, through which flows a considerable stream;\* wild-looking lofty mountains rise abruptly from either shore. From the narrow bends of this sound it would generally be found difficult of access to a sailing vessel.

**CLIO ROCK**, with 9 feet, on which H.M.S. *Clio* struck in February 1870, lies in the second reach of Bligh sound, about half-way between Turn-round and Evening points; it is the outer rock of a cluster surrounded by very deep water  $2\frac{1}{2}$  cables from a bluff point on the eastern shore of the sound; between it and the point are two rocks of similar character, with about 6 feet over them.

The Clio rock is steep-to, on its south-west side 24 fathoms was found within 20 yards of the rock, on the north side soundings of from 5 to 9 fathoms were obtained at a distance of 60 yards.

From the rock, Bare cone bore W.S.W., Turnround point N. by E.  $\frac{3}{4}$  E., and Evening point S.  $\frac{3}{4}$  W.

**CAUTION.**—Mariners are cautioned that Bligh sound being similar in its features to the other sounds and inlets on the western shore of the Middle island, in having deep soundings close to steep and precipitous shores, and that although the existence of detached outlying rocks is considered to be quite exceptional, still vessels navigating these waters must

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\* Owing to rapids and scattered fragments of rocks, it was not possible to examine this river beyond two miles from its mouth, when the *Acheron's* party came on the fresh footmarks of some natives, who were heard making their escape through the thick underwood:—these people, as far as we could learn, belong to a small isolated and almost unknown tribe, rarely seen even by their own countrymen, by whom they are called wild men of the mountains.—From the Notes of Captain Stokes, H.M.S. *Acheron*.

use due precaution, as similar dangers to the Clio rock may exist where the present surveys would imply there was the usual deep water.

From Bligh sound to Milford sound, a distance of 16 miles, the coast continues its general trend of N.E. by N., broken by Little and Poison bays, both unfit for anchorage, and which lie at distances of 3 and 8 miles respectively from the former sound, the bold cliffy coast line between them projecting to the north-west about one mile from the general trend. In passing along this shore, at a distance of little more than one mile, no bottom was found with from 70 to 160 fathoms' line.

**MILFORD SOUND**, the northernmost of the series of inlets now described, though comparatively inconsiderable in extent, yet, in remarkable feature and magnificent scenery, far surpasses them all. The mountains by which it is surrounded are the highest on the coast, with the exception of mount Cook, 120 miles to the north-eastward. Pembroke peak, about three miles inland, perpetually snow-capped, rises over its northern side to an elevation of 6,700 feet, and Llawrenny peaks, a very remarkable saddle-backed mountain, attain nearly the same elevation on the southern side; but perhaps the most striking features are the remarkable shaped Mitre, rising abruptly to a height of 5,560 feet immediately over the south side of the sound; and a dome-shaped mountain on the opposite shore, nearly bare of vegetation, which from its peculiar colour, resembles a huge mountain of metal; these Alpine features and its narrow entrance, apparently still more contracted by the stupendous cliffs which rise perpendicular as a wall from the water's edge to a height of several thousand feet, invest Milford sound with a character of solemnity and grandeur which description can barely realise.

From seaward, the entrance makes as a bay, of which St. Ann's is the south point, and Yates point the northern; they are 5 miles apart in a N.  $\frac{1}{4}$  E. direction; near St. Ann's point is a remarkable jib-shaped white stripe.

**BRIG ROCK**, 10 feet above water, lies three quarters of a mile outside a line between these two points, and bears N. by W. distant 3 miles from St. Ann's; it is one and three quarters miles from the shore with a reef of rocks encircling it for a distance of 2 cables.

**ANITA BAY.**\*—After rounding St. Ann's point, which is low and rocky, Fox point, with a small islet close off it, lies half a mile to the south-east, and immediately round it, in Anita bay, convenient anchorage will be found in from 12 to 18 fathoms, with the small islet bearing north about a cable distant. Here a vessel will be sheltered from north-west winds; with winds from north a swell rolls round the point; by anchoring half a cable off shore, and hauling close in with hawsers fast to the trees, H.M.S. *Acheron* found considerable shelter.

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\* See plan on Admiralty chart, Foveaux strait to Awarua river, No. 2589, scale,  $m = 0 \cdot 2$ .

From Anita bay the sound runs up in a funnel shape S.E.  $\frac{1}{2}$  E. for  $1\frac{1}{2}$  miles, when the narrow entrance is reached, it here barely exceeds  $\frac{1}{4}$  mile in width, towering perpendicular cliffs rising on either side, the soundings in mid-channel being 60 fathoms; the sound then trends in an easterly and S.E. by E. direction for  $6\frac{1}{2}$  miles between stupendous cliffy walls, the widths varying from one-third to three-quarters of a mile; a cable from the highest cliffs on the north shore, near a large waterfall, 214 fathoms mud was obtained; the general depth of water must be very great, as no other soundings could be gained with 180 fathoms of line, except close to the head of the sound. Four miles above the entrance, on the north shore, is Harrison cove, a confined and deep water anchorage, with a steep and winding valley running down to it from Pembroke peak.

**Freshwater Basin,\*** the head of Milford sound, terminates in two coves or basins separated by a low tongue of wooded land fronted by a steep-to tidal boulder bank. In the eastern of these coves (Freshwater basin) H.M.S. *Acheron* moored in 12 fathoms; this basin is only 100 yards wide at its entrance, with a bar of  $3\frac{1}{2}$  fathoms at low water; it opens out within to the width of a cable; a magnificent waterfall of 700 feet close to the entrance serves as a guide to it. The western cove is larger, with a greater depth of water inside, but its entrance is shallower.

**TIDES.**—It is high water, full and change, in Freshwater basin, at 11h. 15m.; the springs rise 8, neaps 6 feet.

**COAST NORTHWARD OF MILFORD SOUND.**—From Milford sound to Yates point, a distance of 5 miles in a N. by W. direction, the high wooded slopes are fronted by a succession of sandy or shingle bays, with straggling rocks extending some distance off the point. The channel within the Brig rock has not been examined; vessels are therefore recommended to pass outside; 20 fathoms, sand and gravel, will be found half a mile from it.

From Yates point the coast trends N. by E.  $\frac{1}{2}$  E. 12 miles to the Kaduku river; 2 miles northward of Yates point and half a mile from the shore, is a patch of detached rocks; and again to the northward are three deep sandy bays, the middle of one which is Martin's Bay.

† **MARTIN'S BAY,** in lat.  $44^{\circ} 20' S.$  The Kaduku or Hollyford river,

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\* See plan of Freshwater basin, on Admiralty chart, No. 2,589.

† The discovery of gold on the western shores of the Middle island has added much importance to the anchorages along that coast. The town of Hokitika, it is stated, numbers about 7,000 people, Greymouth about 3,000, and the whole population of the West coast is at present estimated at from 40,000 to 50,000 colonists. In 1850 not a single European resided on the whole line of coast.—Captain C. W. Hope, H.M.S. *Brisk*, 1867.

flowing out of Lake Kakapo or McKerrow, runs into this bay, and is navigable for small vessels into the lake, and as there is a perfectly easy pass of only 1,400 feet above the sea between this and the great lake Wakatipa, (the north-western extreme of the Otago gold fields,) there is little doubt that ere long this will become a haven of importance, as it is said to be capable of much improvement.

From the projecting rocky point of Awarua, 3 miles north of this river, the coast trends N.N.E. 25 miles to Cascade point, and is apparently free from dangers, excepting the Seal rocks, which extend a short distance from the shore about midway between the two points, and a small rocky islet 3 miles southward of Cascade point half a mile off a sandy beach. The land immediately over the coast is steep and of moderate height, but is backed by lofty and rugged mountain ranges; Barn bay, an indentation 6 miles southward of Cascade point, has a remarkable sharp peak rising over its south point, off which are two barn-shaped islets.

**CASCADE POINT** is a steep projecting bluff, or rather line of cliffs of moderate height, the face bare and striped by numerous falls of water, which after rains pour down its steep sides, and are visible a considerable distance seaward; from this circumstance it has derived its name. Immediately south of these cliffs and near the coast is a remarkable dome-shaped mountain, and inland a snow-capped range of great height, with peaks of every variety of shape and ruggedness.\*

From Cascade point, the projecting point of Jackson bay bears N.E. by E.  $\frac{1}{2}$  E. distant  $11\frac{1}{2}$  miles; this latter is a remarkable point rising boldly from the sea with a low neck, separating it from higher land; it will be readily recognised approaching from any direction, the coast between it and Cascade point being a sandy bight, and that to the eastward a straight sandy beach 20 miles in extent, with low land stretching a few miles from the beach.

**Soundings.**—48 fathoms, rocky bottom, will be found between Cascade point and Jackson bay at the distance of 4 miles from the land; a heavy swell generally sets on this coast, which renders a cautious approach necessary.

**JACKSON BAY** is 55 miles northward of Milford sound, and at the south end of the long extent of sandy beach just mentioned. This bay is occasionally visited by whale ships from the facility of gaining or leaving the anchorage, as also for chance supplies of vegetables from the natives; it affords good protection from southerly or westerly winds, and some shelter even as far round as N.N.W., but between that bearing and N.E. is perfectly open. In making for the anchorage, Jackson point must be given a berth of half a mile, as several rocks above water and awash extend nearly that distance from it; on rounding these rocks, a small

\* See Admiralty chart Awarua river to Waiau river, No. 2590; scale, *m.* = 0.25 inches.

conical islet, with bushes on the summit, will be seen a short distance from the western shore ; the anchorage is in 7 fathoms sand, a short half mile to the S.E. of this islet.

There would be no difficulty in quitting Jackson bay at the commencement of a north-west gale, and it would not then be prudent to remain, as in the event of the wind backing round to the north, a vessel would be exposed to great risk. Northerly gales\* are generally preceded by a swell setting into the bay ; 2 miles from the anchorage is a native village, at the mouth of a small stream, where there are small cultivations ; there are also larger patches further to the northward a short distance inland ; boats can only land on the beach here in moderate weather ; to the north-east of the river there is always a surf.

With the exception of the roadstead under cape Foulwind in southerly winds, Jackson bay is the northernmost anchorage on this coast, where shelter can be procured for large vessels.

**Current.**—The current which has been noticed as setting to the southward at the rate of nearly one mile an hour along the south-west coast of the Middle island is not much felt to the northward of Milford sound, and off Jackson bay may be said to cease ; from this cause, as also the more frequent occurrence of southerly and south-west winds, the difficulty experienced by sailing vessels in getting to the northward is considerably lessened.

**COAST N.E. OF JACKSON BAY.**—From Jackson bay the general trend of the coast is N.E.  $\frac{1}{2}$  N. for 80 miles, or as far as Abut head ; the first 20 miles is a nearly straight sandy beach, with two small rivers towards its northern end ; three conical wooded hills rise out of the low land which extends for some distance inland from this beach ; the southernmost is the highest and most remarkable, it is two miles from the beach, and bears East distant 6 miles from the anchorage in Jackson bay.

**TAUMAKI, or OPEN BAY ISLETS,** are a small rocky group lying off the coast 3 miles from the sandy beach, bearing from Jackson point N.E., distant 13 miles ; they are surrounded by sunken rocks which extend nearly 3 miles to the south-west and one mile to the westward and north-east ; vessels should pass outside this group ; 3 miles to the westward of them 17 fathoms will be found, increasing to 30 shortly after passing them to the

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\* Northerly gales generally commence at N.N.E. with clear weather, veering to north-west, with heavy squalls and thick rain ; from this point the gale is most severe, and if disposed to last, will back round again to north. A shift to the south-west is generally preceded by a lull with heavy rain, and at the latter point again blows hard, but the gale is then of short duration, and soon subsides into a moderate breeze, with fine weather.

Gales are not so frequent here in summer, though their directions are much the same ; south-west and W.S.W. winds then prevail.

northward. Several dangerous rocks have been discovered in the neighbourhood of these islands, and as the coasting steamers frequently pass inside of them, caution is required in doing so, until the nature and position of the several dangers have been determined by further examination.

**Anchorage.**—The anchorage under Open bay islets, as described by Captain Kerley of the *Bruce*, is sheltered from all quarters, and may be safely used by any vessel. It is situated under the east side of the main island, from the northern point of which a reef of rocks runs out some distance towards the mainland, and forms an excellent breakwater when the sea sets heavily on the coast from north and north-east. Another reef to the southward breaks the force of a south and south-west sea. A rapid current ran south past the island whilst the *Bruce* remained there; its rate was estimated at between three and four miles an hour.\*

**ARNOTT POINT and MOUNT COOK.**—Seven miles from the north end of the long sandy beach is Arnott point, the first projecting clifly headland north of Jackson bay, and has a high conical hill over it; the great southern Alps here send their steep spurs down to the coast, and in clear weather the summit of the snow-capped and magnificent mount Cook, † distant 50 miles, will be seen rising in two distinct peaks 12,000 and 13,200 feet above the sea, with their base generally enveloped in clouds; this is the highest mountain in New Zealand, and justly bears the great navigator's name; in character and ruggedness of outline it somewhat resembles the Kaikora range on the east side of the island.

**COAST from Arnott Point to Abut Head.**—From Arnott point the coast is clifly and almost straight for 15 miles to Titihai or Tititira head, ‡ with scattered rocks extending off the points about one-third of a mile; the soundings 5 miles from the land vary from 60 to 46 fathoms, sand; on the next 18 miles of coast line are three sandy bays, the projecting bluffs which separate them from the low land on either side having the appearance from seaward of islands lying near the coast; the northern of these bays is the most extensive, and has a remarkable range of turreted parapet land

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\* The information relating to an anchorage under Open bay islets is extracted from the *Lyttleton Times*.

† The earliest recognition, and determination of position and height of this mountain range, are due to the surveys made by Captain Stokes and the officers of H.M.S. *Acheron*, 1851, by whom its name was given in honour of their predecessor.

‡ Titihai head was the farthest point reached by that enterprising and indefatigable traveller, Mr. Brunner, of the New Zealand Colonial Survey Department, whose remarkable journey in 1846-7, down the Buller river, and along the west coast of the Middle island, undertaken partly with a view to the extension of the Nelson district, is recorded in the Journal of the Royal Geographical Society for 1850, vol. xx. p. 344.

Haarst river runs into the sea between Open bay islets and Arnott point—its entrance, according to the survey map of Bowring of Canterbury forwarded to Hydrographer, 1863, is in 43° 51' S.



near the coast, its north bluff being a conspicuous yellow cliff; mount Cook is only distant 18 miles from this part of the coast. Abreast these sandy bays the off shore soundings decrease, at the distance of 10 miles, varying from 46 to 33 fathoms dark sand and mud.

**BRUCE BAY,\*** is the bay lying between Makawihō and Heritanewha points, and in its general features resembles Jackson bay, though smaller. The anchorage is close under the South head, in 3 fathoms water, with hard speckled sand but apparently good holding ground; and is well sheltered from all southerly winds. The South head is a bold rocky promontory stretching out a mile and a half in a north-west direction, thus forming the shelter, and in the adjoining bay to the southward the same headland affords protection from the only winds to which Bruce bay is exposed. The vicinity of Bruce bay to Haast river and the gold diggings in that locality renders it an important place of shelter. Haast river has a navigable entrance for small vessels.

From the Yellow cliffs the coast is a succession of rocky points and bluffs, with occasional sandy beaches between, as far as Abut head, three of these projections are remarkable. Long point or Kohuamarua bluff (9 miles S.W. from Abut head) tapering to the sea from a lofty spur of the high mountain range inland, terminates in a low cliffy extreme; White head, 2 miles further north, is a bluff point, so named on account of its colour; while Abut head is a strikingly bold headland abutting on the coast as a spur from the lofty mount Cook; between the Yellow cliffs and this headland no soundings were obtained with 45 fathoms line 6 miles from the shore; 8 miles S.W. of Abut head is Okarito lagoon.

**OKARITO LAGOON,†** into which the river of the same name empties itself on the eastern side, is situated about 15 miles to the southward of Wanganui river. It is a regular tidal harbour, the sea flowing and ebbing with great velocity; the flood continues to run in one hour after it is high water in the offing.

**Tides.**—It is high water, full and change, at Okarito lagoon at 11h. 40m., range about 9 feet.

The entrance is practicable for vessels of light draught, there being 14 feet over the bar at high-water springs; the present channel runs north-west and south-east, vessels entering should keep well over to the south shore until abreast the North spit, and then stand straight across for the opposite side to avoid the current setting upon a middle shingle bank.

About a quarter of a mile from the entrance the channel is divided by an island into two branches, the northern one being navigable for a

\* From the authority of Captain C. W. Hope, H.M.S. *Brisk*.

† From Hydrographic Notice, No. 19, October 1867.

See Admiralty chart Waiau river to cape Foulwind. No. 2591; scale,  $m = 0.25$ .

distance of from one mile and three quarters to two miles, with from 4 to 6 feet at low water, while the southern arm has the same depth of water to a distance of about one-eighth of a mile.

The holding ground is very bad, and vessels must not trust to their anchors and cables if moored in the tideway.

**LIGHT.\***—A signal mast has been erected exhibiting the same code of signals as those in use at the Grey and Hokitika rivers, and on which a *green* light is hoisted at night, distinguishing it from the bright light at Greymouth and the *white* light at Hokitika signal stations. This light is of importance to vessels arriving off the port at night, enabling them to keep their position when standing off and on, rather than risk anchoring on rocky bottom or bad holding ground.

The coast to the northward of Okarito for a distance of 6 miles is a low sandy bank covered with coarse grass and flax, whereas about half a mile to the southward there is a high rocky headland from which foul bottom apparently extends some distance in a north-westerly direction.

**COAST from ABUT HEAD to the N.E.**—From Abut head to Matungitawau point, bearing N.N.E.  $\frac{1}{2}$  E. distant 60 miles, the coast is for the greater part low and sandy, falling a little back from a straight line, and with few remarkable features. The mountain ranges, which are here of moderate elevation, recede from 20 to 30 miles from the coast, and appear intersected by several valleys or passes, through which there is possibly communication with the Canterbury plains; the breadth of the island in these localities being about 85 miles.

**Cliffy Head.**—N.E.  $\frac{1}{2}$  N., 9 miles from Abut head, is a cliffy projection about 3 miles in extent, the intervening coast is composed of low cliffs, fronted by a sandy beach, through which the small river Wanganui runs into the sea,  $7\frac{1}{2}$  miles from Abut head; a rather remarkable hill or headland, close to the coast, rises over the south bank of this river.

**WANGANUI RIVER** is 29 miles to the south-west of Hokitika river; the entrance is very narrow, and unsafe for vessels of any description to attempt; the South spit overlaps the mouth and runs for a considerable distance to the northward, where, from the coast being rockbound, a vessel endeavouring to take the bar, and stranding, would without doubt become a wreck.

**Caution.**—The coast between Wanganui and Okarito should be approached with caution, as the rocks from the headlands apparently run a considerable distance seaward.

**BOLD HEAD (Paramata).**†—12 miles N.E. of the Cliffy head is Bold

\* For New Zealand general harbour signals, see page 13.

† The coast of the Middle island, between Bold head and cape Farewell, a distance of 180 miles, was traversed on foot by Messrs. Brunner and Heaphy, of the New Zealand Survey Department, in 1846, and from the chart constructed by them a great portion of coast line detail was adopted to the survey of H.M.S. *Acheron* made in 1851.

head, as its name imports, a bluff point, standing out from the low coast on either side of it; but lying in a bight or recess of the coast, it forms no very prominent object from seaward.

Between Bold head and Matungi-tawau point, a distance of 40 miles, is a nearly straight sandy beach, intersected by several rivers and some smaller streams; the southern of these rivers is Hokitika, or Brunner and Aréhura, the former is 21 miles from Bold head; Teremakau is about 8 miles further north, and the Grey, or Mawhera river is at the north extreme of the beach, 8 miles north of Taramakau point; the latter river alone is said to be navigable for small craft.

**HOKITIKA RIVER**, in latitude  $42^{\circ} 41' S.$ , longitude  $170^{\circ} 59' East$ , is navigable for vessels of a light draught of water to the distance of one and a half miles from the entrance, but the bar is so constantly shifting its position that no directions for entering could be depended on, local pilotage alone being reliable. There is anchorage from 2 to 3 miles off its mouth in 8 to 10 fathoms, with good holding ground of dark sand.\*

Vessels intending to take the bar, being obliged to anchor to await daylight or high water, should bring up a little to the southward of the port, for although there is a southerly current in the offing, a strong northerly set will often be found within the break on the bar.†

A constant heavy westerly swell rolls in on this portion of the coast; and although the prevailing gales blow from north-west, south-west, and south-east, enabling vessels to lay well off shore and obtain an offing, the masters of vessels should not neglect watching the weather carefully, and in the event of its threatening, put to sea in good time.

The heaviest break of the sea at Hokitika is immediately outside the bar, in 2 fathoms water; the bar is constantly shifting in direction and varying in depth; after a heavy fresh, the stream of the river runs straight out to sea, and during an interval of moderate or fine weather the sea piles up either the northern or southern spit, forming a series of middle banks with channels between, the depths averaging from 12 to 18 inches only at low water.

**LIGHT**.—The light exhibited from a flag-staff at the north side of the entrance of the Brunner or Hokitika river is *white*.

**Anchorage**.—The best anchorage off Hokitika is in 15 fathoms, with the flag-staff bearing E.S.E., distant  $2\frac{1}{2}$  or 3 miles, veering cable to 60 or 70 fathoms; this is in good holding ground, and a vessel may here ride in safety except with westerly winds.

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\* From the authority of Captain C. W. Hope, H.M.S. *Brisk*, and the port officer at Lyttelton.

† For general harbour signals, see page 13.

**Tides.**—It is high water, full and change, at Hokitika bar, at 9h. 39m., and the mean rise from  $8\frac{1}{2}$  to 9 feet, but this rise is greatly affected by the amount of freshet in the river.

**TEREMAKAU RIVER\*** is about 8 miles to the southward of Grey river, or midway between Grey and Hokitika rivers; at the present time it empties itself into the sea by two channels, one running northwards, which is nearly dry at low water, and the other in a south-west direction, with 5 or 6 feet water in it. The entrance is not so confined as the Grey river, but it is not equal to the Hokitika; small vessels, drawing 4 or 5 feet water, could cross the bar without incurring greater risk than they would at either of the other rivers.

**Tides.**—It is high water, full and change, at Teremakau river, at 9h. 55m., mean rise 9 feet.

**GREY or MAWHERA RIVER†** flows through an extensive valley running in an easterly direction about 12 miles, when it divides, one branch taking a northerly and easterly direction towards the centre of the island, the other runs south-easterly, communicating with the Brunner lakes, from whence there is a native pass to the Canterbury plains.

Grey river, in latitude  $42^{\circ} 28' S.$ , longitude  $171^{\circ} 12' E.$ , like all the other rivers on the west coast, has a bar at the entrance which is constantly shifting, rendering the navigation of vessels entirely dependent on local pilotage. After a heavy fresh, when the channel breaks out straight in a westerly direction, it is safe and easy of access for vessels drawing 8 or 9 feet water, but in the absence of any fresh in the river the channel makes either to the north or to the south, but usually to the north, running for a short distance nearly parallel with the coast line, and at such times the entrance of the Grey is far more dangerous than that of the Hokitika river, because, in crossing the bar, the sea takes the vessel on the beam when in the heaviest break, and unless under command with very small helm she is in danger of being stranded on the beach before getting in a position to keep away for the entrance of the river, which latter although deep, is very narrow.

**Tides.**—It is high water, full and change, at Grey river, at 10h. 15m.

The soundings on the coast between Abut and Bold heads, at the distance of 15 miles off shore from the former, is 49 fathoms, and at 12 miles from the latter, 25 fathoms dark sand; proceeding northward, from 53 to 22 fathoms will be found 6 miles from the coast until abreast Taramakau

\* This river was explored by Mr. Brunner, in 1847, on the return to Nelson from his second journey down the west coast.

† From the authority of Captain C. W. Hope, H.M.S. *Brisk*, and the port officer at Lyttelton.

‡ For general harbour signals, see page 13. A bright light is shown at Grey river, no information as to position.

river, between which and Grey river, at the same distance from the land, are from 20 to 17 fathoms.

**Matungi-tawau point** is a remarkable double bluff, of moderate height, composed of limestone cliffs, with a sandy cove between. From this point the coast trends N.  $\frac{1}{2}$  E., with clifly shores and scattered rocks extending in some parts half a mile from the shore. A range of snowy mountains, the Paparoa mountains four leagues inland, runs parallel with the coast, extending to cape Foulwind, occasionally attaining elevations exceeding 6,000 feet; nearer the coast line is a lower range, rendered remarkable by the irregular and varying outline of their summits.

**Perpendicular Point**, and Ti-Miko cliffs, 16 miles northward of Matungi-tawau point, is a bold projection of the coast rising abruptly from the sea; this and the lower range of mountains with their peculiar jagged outlines just alluded to, render this part of the coast very striking; the latter is probably the Five Fingers range of D'Urville.\*

The next projecting point, a saddle-shaped summit, is 10 miles to the northward, the Five Fingers rocks standing about half a mile off the coast, which is here formed of low terrace land. The highest peak of the snowy range, 6,380 feet high, is 15 miles eastward of this point.

**Robertson point**, 5 miles N.N.E.  $\frac{1}{2}$  E. from the Five Fingers rocks, is the termination of the cliffs; a small river runs in just to the northward of it; here the high land recedes and the country becomes low and thickly wooded, with a sandy coast line extending to cape Foulwind, distant 10 miles.

**Soundings.**—The soundings at 6 miles from the coast, between Matungi-tawau point and this cape, varies from 30 to 50 fathoms, sand.

**CAPE FOULWIND** (*Tauranga*) is rendered remarkable by three rocks (the Steeples) which lie off it, and also by the coast turning sharply to the eastward from it. The cape itself is a low clifly point, well wooded, the land within rising gently to the base of the mountains to the southward. The coast,  $2\frac{1}{2}$  miles southward of cape Foulwind, is fronted by rocky islets, within which, in the small sandy bay of Tuaranga (Penguin bay) the sealing boats land. Under cape Foulwind vessels may find shelter in southerly winds.

**The Steeples** are three conical rocks, visible at a distance of 10 or 12 miles from a vessel's deck, and show prominently from the southward; they occupy a space of  $1\frac{1}{2}$  miles, and bear N.  $\frac{1}{2}$  W., the northern extreme being distant  $2\frac{1}{2}$  miles from the cape. Several smaller rocks awash are scattered within and about them; the narrow channel between them and the cape is rocky, and only fit for boats.

\* Voyage autour du Monde, by M. D'Urville, Capitaine de Vaisseau, in the French Corvette *Astrolabe*, 1826-29, vol. ii. pp. 11-12.

**COAST from CAPE FOULWIND to ROCKS POINT.**—From cape Foulwind the coast recedes to the eastward, and forms an extensive bight of which Rocks point is the northern limit; this latter point bears from the cape N. by E., distant 54 miles, the depth of the bight from a straight line between the two points being about 5 leagues.

**Falcon Rock.**—With reference to the existence of a sunken rock midway between the Steeples off cape Foulwind and the entrance of Buller river, which rock was reported by H.M.S. *Falcon* in 1868 on the authority of the (then) harbour master at Hokitika,—the following information has been received from the Secretary of Customs at Wellington :—\*

Falcon rock was searched for in vain by the harbour master of Westport, Buller river, in the Local Government steam-vessel *Luna*, in November 1873, under favorable conditions of wind, weather, and tide. The vessel steamed three times in a direct line between the northern Steeple and the entrance of Buller river, and immediately over and twice round the reported locality of the rock, yet there were no signs of broken or shallow water, and the shoalest cast obtained at low-water springs was 4 fathoms. It is therefore considered that Falcon rock does not exist in the position formerly given; and the search of the *Luna* pointed to the conclusion that the rock seen was probably one of the known outlying dangers a few hundred yards E. by N. from the northern Steeple.

Between Cape Foulwind and the Buller River there is probably good anchorage in the bay, where vessels may lie sheltered during southerly and south-west winds.

It is important that all craft trading to the West coast rivers should be provided with good hawsers and a spare anchor.

**BULLER or KAWATIRI RIVER.**†—The entrance of this river, which bears east, distant  $7\frac{1}{2}$  miles from cape Foulwind, is one of the largest in New Zealand. It has its source in the lakes Rotuaro and Rotuiti, 40 miles south-westward of Nelson. In its course to the sea it receives the accession of several smaller streams, and becomes a river of considerable magnitude, varying in width from a quarter to a third of a mile; it is subject, however, to very heavy freshes from the mountain torrents, and rises with great rapidity, frequently between rocky gorges and cliffs so perpendicular as to be in places inaccessible. From these causes, and the barrenness of the country through which it flows, it will probably never become of any great importance as a navigable river. The valley of the Buller forms an extensive gap between the high mountains which bound it on either side, running in a south-easterly direction several miles, and

\* See Admiralty chart:—Cape Foulwind to D'Urville island, No. 2,616; scale,  $m = 0.25$ .

† The Buller river was explored by Messrs. Brunner and Heaphy in 1846-7.

is remarkable from seaward. These snowy mountain ranges extend parallel with the coast, at varying distances of three to four leagues, nearly as far as cape Farewell.

The Buller river is described as being the most easily navigable of all the numerous streams on the West coast, having a great depth of water on the bar, and the advantage of being sheltered from the prevailing south-westerly swell by cape Foulwind. A large township, Westport, has been formed at the mouth of this river.

From the mouth of the Buller river, the coast line, which is low and wooded, fronted by a narrow strip of sandy beach, and intersected by several small streams, trends to the north-east and N.N.E. 23 miles; when nearly in the extreme depth of the bight, the sandy beach is succeeded by a remarkable line of cliffs, which extend 12 miles. Towards their northern extreme are two very conspicuous white bluffs, visible a long distance from seaward.

The Wanganui river runs into the sea  $2\frac{1}{2}$  miles northward of these bluffs, at the commencement of a sandy beach, which runs in a straight line 14 miles N.N.W.  $\frac{1}{4}$  W., intersected by three small rivers, Mahana, Karamea, and Parara, near its central part, and a fourth, the Kollahai, at its northern extreme. Near the latter river the cliffs again occur, and the coast, which now trends N. by W.  $\frac{3}{4}$  W., 11 miles to Rocks point, is indented by numerous small sandy bays with rocky projections between.

The Heaphy, or Wakapoi river, whose entrance between two high bluffs sloping to the sea is remarkable, lies  $4\frac{1}{2}$  miles south of Rocks point.

**Soundings.**—The depth of water across the entrance of this great bight, from cape Foulwind to abreast the two white bluffs in its depth, is from 30 to 40 fathoms; it then deepens, and at the distance of 5 miles from the clifty shore, between Kollahai river and Rocks point, no soundings were obtained at depths of from 50 to 60 fathoms.

**ROCKS POINT**, which received its name from the numerous scattered rocks extending about half a mile from the shore in its neighbourhood, is a bold projection, from which the coast rounds away N.N.E. towards cape Farewell, distant 37 miles.

Kaurangi point, with a reef extending from it a short distance to the south-west, is 11 miles to the N.N.E. of Rocks point, and has on its northern face a remarkable white stripe caused by a land slip; this is a good sea-mark, and visible from a long distance. A sandy beach now extends northward 13 miles, interrupted by an occasional clifty projection; towards the north-east extreme of this beach a white patch of sand will be observed,

just within high-water mark ; a bank of shoal water extends half a mile off its southern end ; this patch will denote the approach to Wanganui inlet in coming from the southward, its entrance being 8 miles to the north-east with some cliffy points intervening.\*

**Stewart Breaker.**—A sunken rock has been reported, lying 8 miles off nearly midway between cape Farewell and Rocks point. This rock was seen breaking heavily, after a south-west gale, the following bearings were taken near the breakers: Cape Farewell high land N.E. by E., Rocks point South ; the remarkable landslip north of Kiourangi point S.S.E. ; from this position the breakers extended S.W.  $2\frac{1}{4}$  miles, and places the danger approximately in lat.  $40^{\circ} 39' S.$ , and long.  $172^{\circ} 13' W.$

**WANGANUI INLET.**—The entrance shows distinctly from seaward ; the points are somewhat remarkable, being high and sloping gradually to the sea, with more elevated land behind ; the south head after sloping, rises again in a cone from the water's edge, and presents a yellowish cliffy projection ; mount Burnett, or Knuckle hill, with its double summit, which is so conspicuous an object in Massacre bay, bears E.S.E. distant 6 miles from the entrance.

The bar, which stretches across from the heads, has 6 feet at low water, and may be crossed at high water by vessels of from 10 to 12 feet draught, the deepest channel being close along the southern shore ; when inside the water deepens to 3 and 4 fathoms. The inlet, after running in a S.W. by S. direction for little more than one mile, separates into two arms, taking a north-east and south-west direction or parallel with the coast ; the north-east arm is shallow, and almost dries at low-water ; there is anchorage in 4 fathoms one mile within the entrance close on the southern shore ; to enter, moderate weather and a leading wind is necessary ; south-west winds blow down the southern arm, and generally right out of the harbour.

The bar at the entrance has not been closely examined, but vessels of the draught before mentioned have crossed it.

**TIDES.**—It is high water, full and change, at Wanganui inlet at 9h. 20m. ; the springs rise 6 and 7 feet.

**COAST TO CAPE FAREWELL.**—From Wanganui inlet the coast trends N.E.  $\frac{1}{2}$  N. to cape Farewell, distant 8 miles.

**Curious Cliff,**  $3\frac{1}{2}$  miles from cape Farewell, is a remarkable piece of table land, its northern end having fallen away by a landslip : close to the shore, in front of it, is a small perforated rock, Archway islet ; several scattered rocks lie off the adjacent coast, apparently fragments broken from the cliffs.



Coming from the southward, the land about cape Farewell has a hummocky appearance, and is of moderate height, the extreme falling down in broken cliffs, where it joins Farewell spit. At the proper navigating distance of 3 miles from this coast the soundings range from 36 to 40 fathoms.

When cape Farewell bears south about 3 miles distant, an E. by N.  $\frac{1}{4}$  N. course leads nearly 4 miles outside Farewell spit, in from 29 to 34 fathoms, fine gray sand; the high sand mound, near the centre of the spit, will be seen in passing at this distance, as will also the lighthouse, and from aloft, the bushes on its eastern high-water extreme. For description of light see page 168.

South-west Winds.—It is necessary to observe that a south-west wind on this part of the coast generally veers to the westward, and draws into Cook strait after passing cape Farewell.

The marks for clearing the end of Farewell spit have been already given in the portion of this work which treats of those places, pages 167 to 170.

**TIDES.**—On the outer coast of cape Farewell it is high water, full and change, at 9h. 0m.; the flood stream commences at 6h. 0m., and runs to the south-west, parallel with the coast as far as Wanganui inlet, at the rate of from  $\frac{1}{2}$  to 2 knots.

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## CHAPTER X.

## WINDS, WEATHER, AND METEOROLOGY.\*

THE climate of the shores of New Zealand, it must be admitted, is stormy and boisterous, although its character in this respect, having been derived principally from the reports of vessels which have visited the settlements in Cook strait, where gales of wind are certainly more prevalent than in most other parts, has doubtless been exaggerated. Embracing however, as these islands do, so considerable an extent of coast line extending over 800 miles of latitude, with its varied configurations of lofty mountain ranges, extensive plains, and forest tracts, there must necessarily exist, irrespective of local influence, great varieties of wind and weather.

It is accordingly observed that the north and north-eastern coasts of the North island are most exempt from heavy gales, that the eastern and southern coasts are subject to south-east gales, to which, from the scarcity of harbours, ships are much exposed; that Cook and Foveaux straits are visited by frequent and sometimes furious gales from north-west and south-east, while the prevailing winds on the entire western coasts are from north-west to south-west.

In order, however, to offer the seaman the results of the increasing experience derived from the observations of recent navigators and settlers on the coast, it is proposed to divide the islands into districts for a more detailed description, as follows :—

1. From the North cape to the East cape of North island.
2. From East cape to Cook strait.
3. Cook strait.
4. North island.—West coast.
5. Middle island.—East coast.
6. Foveaux strait and South island.
7. Middle island.—West coast.

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\* The information contained in this chapter is derived from various sources, collected during the surveys made in H.M. ships *Acheron* and *Pandora*, but especially from a paper on the Meteorology of New Zealand, by Captain B. Drury, R.N., published by the Meteorological Department of the Board of Trade, 1856. This officer, in discussing four years' observations made on board H.M.S. *Pandora*, as also some valuable contemporaneous ones, thus remarks :—

“In some measure they show how uncertainly the ordinary winds of one portion of these islands affect other parts, and yet, if the gale is extraordinary (or an unusual one), how generally the effects are felt.

“It is a matter of interest to trace the extent of the almost rotary storm, the north-east wind, which commences at East, and frequently after suddenly changing from north-east to north-west and south-west, ends within a few points of where it commenced. This is more observable at sea than in the vicinity of the land, where it is an expanded rotary gale, and therefore has not the dire effects of a hurricane. Its prognostics are so certain, and commence so gradually, that the anticipated changes can be made subservient to effecting a passage.

“This north-east gale appears to be common to the southern regions from Bass strait eastward to Tierra del Fuego. Descriptions of it at the latter place do not materially differ from what is observed here, except that here they are more decided in the spring and summer than in the winter.”

## 1. NORTH ISLAND.—FROM THE NORTH TO THE EAST CAPES.

*North Cape to Mercury Bay.*

During the summer months, from October to March, the north-east or regular sea breeze is constant on the eastern coast of the North island between the North cape and Mercury bay ; it sets in about 10 a.m., and gradually dies away towards sunset, when it is succeeded by the westerly or land wind. Should the sea breeze, however, continue after sunset and the sky become cloudy, it will generally increase to a fresh gale accompanied with heavy rain lasting for several hours, when the wind will suddenly shift to the westward and the weather become fine.

These regular land and sea breezes cannot be depended on during the winter months, and the general wind seems to be from north-west to south-west ; a north wind with cloudy weather will usually terminate in a gale accompanied with rain, though of short duration.

North-west winds generally blow strong with heavy rain, and seldom last more than twenty-four hours ; the general shift follows the course of the sun. With the wind at West the weather is unsettled and squally, but immediately it veers to W.S.W. and south-west, which it almost invariably does, fine settled weather may be expected to continue for several days.

A strong easterly or south-east gale may be looked for about once in six weeks ; it generally occurs about the time of the moon's full or change, and is accompanied by rain and thick weather, lasting from two to three days ; this wind is preceded by a high barometer, and generally veers round by the northward to south-west.

There is likewise a south-east wind exceedingly cold, with a clear sky and fine settled weather, which frequently continues for several days, terminating in a calm, or shifting to south-west. Westerly gales generally die away at sunset within a short distance of the shore ; their continuance is indicated by a sensible fall in the barometer.

*Mercury Bay to East Cape.*

Between Mercury bay and the East cape the summer breezes are from the westward, dying away at night in and near the shore, but not in the bay ; a north-east gale may be expected once a month, prevailing from March to July. South-east winds are common near the East cape, sometimes lasting for several days, and often very strong, but seldom blowing beyond the Mercury islands. There is also a strong south-west gale, which is dangerous in the roadsteads between cape Runaway and the East cape ; it is preceded by rollers and unsteady flaws of wind.

In the bay of Plenty, the sea breeze blows from the westward, and frequently with considerable strength ; the south-east wind is more common than in the Hauraki gulf, and freshens rather suddenly ; north-east gales, which generally spring from the eastward, come on more gradually and give warning of their approach.

The people residing in sight of White island can foretell weather by the appearance of the steam from its volcano; with west winds the smoke is low, and more of it is seen: the south-east wind, they say, smothers the steam. No doubt the density of the atmosphere affects that vast body of vapour.

## 2. FROM EAST CAPE TO COOK STRAIT.

Going from East cape to Cook strait a very marked phenomenon frequently takes place on rounding the East cape. The strong westerly wind that drives across the bay carries its line a few miles eastward of the cape, but southward of this the breeze is north-east. Sometimes a vessel may be becalmed for hours between two strong breezes from West and north-east. The configuration of the coast at once accounts for this:—The west wind meets with little obstacle in crossing the narrow and comparative low land north of the ranges forming the southern boundary of the bay of Plenty; at the East cape it meets the lofty mountain Ikaurangi, and the breadth of the country now being considerable, the rarefied air over it induces regular sea breezes from the north-east, succeeded in the evenings by the land wind for a short distance from the shore. An exception is the north-east gale, known on this part of the coast as the black north-easter to distinguish it from the ordinary sea breeze from the same quarter. In winter the sea breeze cannot be depended upon, and south-east and South gales set in very suddenly, and even in summer the south-east winds sometimes last for some days.

In Hawke bay in spring there are fierce westerly winds for days, with a low barometer and variable weather, ending in a cold south wind, blowing hard for a short time, when the ordinary weather returns.

This part of New Zealand has a fine climate; the barometer rises for north-east, south-east, and South winds, and falls for North, north-west, and West winds.

In summer the prevailing winds are north-east with a high barometer, the sea breeze sets in about 10 a.m., and is succeeded by a land wind.

In winter the winds are uncertain; a rapidly falling barometer is the sure sign of a southerly gale, they come on very suddenly and often last three or four days, with rain and thick weather; when they come on with great violence they are of shorter duration. The black north-easters are not frequent in Hawke bay they occur about twice or thrice a year in January or February, and again in June and July, they give ample warning of their approach, a high barometer falls much less rapidly than before a southerly gale, the sky has a heavy leaden appearance, and the wind comes in gradually with rain, steadily increasing into a gale, this lasts from 12 to 24 hours, then moderating to a calm.

Proceeding southward, the ordinary sea breeze from north-east will again be found; north-east gales are far less common than on the north-east coast, while those from south-east, which are so uncommon there, are frequent on both sides of the East cape, lasting several days together. The north-east gales are more frequent in March and April; those from south-east during the winter months, the latter accompanied by showers and lightning to the south-east. North winds, with gloomy weather and rain, frequently precede those from south, and the change from north to south is very sudden.

Before north-east gales the barometer is generally very high; they come on gradually, with a leaden sky, rain follows, and they invariably shift to north and north-west veering to W.S.W., and frequently remaining at the latter quarter for some days; these gales seldom last less than forty-eight hours. It will be found that 3 p.m. is not an uncommon time for change during any gales on this coast.

### 3. COOK STRAIT.

In Cook strait the prevailing, indeed the almost constant, winds are north-west or south-east; and approaching either entrance with north-east or south-west winds, the former will almost certainly change to south-east, and the latter to north-west; the changes also from north-west to south-east, and the contrary, are common, and frequently very sudden; lightning or a dark bank of clouds rising are pretty certain indications that the wind will come from the quarter in which they appear, but it is not an uncommon circumstance for a vessel running through the strait with a fair wind on opening out either entrance to be taken aback with one from the opposite quarter, with little or no warning. Gales from these quarters are also frequent, and blow with great violence; those from south-east are most frequent during the winter months of May, June, and July; a falling barometer is a certain indication. They come on very suddenly, last often three days, and are generally accompanied by rain and thick weather. North-west gales are most common in spring and summer; they are exceedingly violent, though generally of short duration, and at their strongest raise a high barometer.

These winds are believed to be almost purely local, and their violence is in a great measure due to the configuration of the shores; they do not extend far beyond the line of Strait, and the harbours which indent its shore; in proof of this, the head of Blind bay on the southern side is remarkably exempt from strong winds, and frequently enjoys fine and calm weather while a gale is blowing in Cook strait.

The finest months are April, August, November, and December. Thunder and lightning are unusual.

TABLE showing the Number of Days the wind blew from any Point of the Compass for each Month in 1868.\*

Month.	Wind.										Morning Observations.								
	Number of Days the wind blew from any Point of the Compass.										Average Daily Velocity in Miles for each Month.	Max. Daily Velocity in Miles in any 24 hours, and Date.	Cloud, 0 to 10.	Number of Days.					
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Gales or High Wind.				Thunder.	Snow.	Hail.	Fog.	Earthquake.	
<b>AUCKLAND.</b>																			
January -	8	0	4	0	2	1	9	1	0	146·9	—	7·1							
February -	2	2	3	3	1	7	8	3	0	147·6	—	7·3							
March -	2	2	4	2	15	4	1	1	0	147·6	—	7·2							
April -	3	1	0	0	11	9	3	3	0	144·0	—	7·0							
May -	5	1	0	13	0	6	3	0	3	126·7	—	7·2							
June -	0	1	3	3	5	4	6	0	8	126·0	—	6·0							
July -	2	0	0	1	11	6	3	4	4	147·6	—	6·6							
August -	3	1	1	3	10	9	0	0	4	152·6	—	6·5							
September	2	4	7	3	5	3	6	0	0	358·4	907-1st	5·4	2	0	0	1	0		
October -	4	1	0	0	3	8	9	4	2	421·2	850-2nd	5·7	6	2	0	2	0	1	
November	2	4	3	0	3	6	9	0	3	375·8	624-25th	5·3	8	1	0	1	0	0	
December	2	0	0	0	4	9	10	4	2	334·6	563-1st	5·4	4	0	0	0	0	0	
	37	17	25	28	76	72	67	20	26										
<b>WELLINGTON.</b>																			
January -	13	2	2	2	3	1	0	6	2	128·6	590-14th	6·6	4	0	0	0	0	1	
February -	9	2	1	2	3	0	1	7	4	115·5	489-20th	5·7	2	1	0	1	0	1	
March -	6	1	1	1	6	0	0	14	2	215·4	455-18th	5·7	7	0	0	0	0	0	
April -	7	2	0	0	5	2	1	11	2	195·6	384-4th	5·5	4	0	0	0	0	0	
May -	5	3	0	4	2	1	0	6	10	193·0	375-23rd	5·8	1	0	0	0	0	0	
June -	9	0	0	3	6	3	0	3	6	206·0	513-6th	7·3	3	0	1	1	1	0	
July -	10	0	0	0	4	3	1	5	8	199·0	595-27th	5·5	3	1	0	0	0	1	
August -	4	0	0	1	4	8	1	2	11	174·8	375-24th	6·4	1	0	1	0	0	1	
September	7	1	4	1	8	1	0	4	4	182·7	385-2nd	5·7	0	0	0	0	0	1	
October -	7	2	0	0	5	4	3	8	2	236·3	490-31st	6·3	10	1	0	0	0	2	
November	1	6	0	6	0	1	0	16	0	127·0	740-22nd	4·8	6	1	0	1	0	1	
December	2	2	1	3	0	2	0	21	0	244·0	480-31st	4·7	10	1	0	0	0	1	
	80	21	9	23	46	26	7	103	57				44	5	2	3	1	9	

\* New Zealand almanac for the year 1874.

(continued.)

Month.	Wind.										Morning Observations.								
	Number of Days the wind blew from any Point of the Compass.										Average Daily Velocity in Miles for each Month.	Max. Daily Velocity in Miles in any 24 hours, and Date.	Cloud, 0 to 10.	Number of Days.					
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Gales or High Wind.				Thunder.	Snow.	Hail.	Fog.	Earthquake.	
<b>NEW PLYMOUTH.</b>																			
January -	5	1	0	1	0	5	5	6	8	199·1	968-3rd	7·1	4	1	0	0	1	1	
February -	2	5	0	2	0	5	4	5	6	249·9	884-3rd	7·3	7	4	0	1	1	1	
March -	0	2	0	3	0	6	7	2	11	—	—	7·1	3	0	0	0	0	1	
April -	2	3	1	3	1	8	7	4	1	261·0	483-30th	6·7	6	6	0	0	0	0	
May -	1	1	1	4	2	6	7	4	5	260·0	639-5th	6·4	5	1	0	0	4	1	
June -	1	1	3	9	1	1	4	1	9	271·0	894-3rd	6·9	5	0	0	0	2	0	
July -	1	3	1	7	5	7	4	3	0	412·5	991-26th	6·1	3	0	0	0	0	0	
August -	2	1	2	13	2	11	0	0	0	391·8	885-13th	5·4	6	0	0	1	0	2	
September	1	4	1	14	0	3	4	1	2	316·0	746-1st	4·0	4	2	0	0	0	0	
October -	3	1	1	3	1	10	6	6	0	312·7	590-16th	7·7	3	3	0	0	5	7	
November	1	3	1	1	0	10	5	6	3	235·5	555-25th	7·3	5	3	0	1	1	4	
December	1	3	0	0	0	11	9	7	0	300·0	470-6th	6·5	2	0	0	0	2	3	
	20	28	11	60	12	83	62	45	45				58	20	0	3	16	20	
<b>NELSON.</b>																			
January -	7	8	1	3	1	3	1	7	0	135·0	240-13th	5·0	0	1	0	0	0	0	
February -	5	8	0	6	0	6	1	3	0	149·0	286-25th	6·0	2	2	0	1	0	0	
March -	1	10	0	1	0	12	0	7	0	130·0	300-20th	4·0	0	0	0	0	0	0	
April -	3	7	0	2	0	13	0	5	0	127·0	252-14th	4·4	0	0	0	0	0	0	
May -	4	7	0	4	0	9	3	4	0	133·0	270-25th	4·0	0	0	0	0	0	0	
June -	4	6	0	6	1	4	2	7	0	98·0	214-12th	6·2	0	0	0	0	0	0	
July -	2	3	0	2	1	10	3	10	0	52·7	202-13th	4·2	3	1	0	0	0	1	
August -	4	8	0	3	4	8	0	4	0	121·6	337-31st	2·6	0	0	0	0	0	0	
September	7	5	0	10	0	5	0	3	0	141·9	380-2nd	3·8	4	0	0	0	0	0	
October -	2	6	0	3	0	11	1	8	0	130·6	290-16th	6·1	0	1	0	0	0	1	
November	4	9	1	4	0	7	0	5	0	159·4	292-27th	5·2	0	0	0	0	0	0	
December	2	7	0	1	0	13	1	7	0	133·0	316-1st	7·0	2	0	0	0	0	0	
	45	84	2	45	7	101	12	70	0				9	7	0	1	0	2	

The following tables are from observations made at Wellington, Port Nicholson, in 1854 :—

TEMPERATURE.

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum	56	61	56	42	34	32	32	32	37	40	42	42
Maximum	83	73	77	62	56	54	55	64	70	74	78	70

BAROMETER (*at Sea Level*).

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Minimum	29·32	29·52	29·40	29·39	28·70	28·72	29·20	29·22	29·15	29·07	29·03	29·1
Maximum	29·99	29·99	30·10	30·45	30·61	30·15	30·07	30·33	30·05	30·02	30·33	30·04

4. NORTH ISLAND.—WEST COAST.

In this division the ordinary wind throughout the year is from north-west to south-west, and from W.S.W. it lasts longest. In summer the north-west and south-west winds are both fine. In winter the north-west wind is prevalent, accompanied by rain.

On the south-western coast, when clear of the influence of Cook strait, there are regular land and sea breezes during the summer season, the latter from south-west and light winds off the land during the night. In winter the weather is variable; the spring and fall of the year bring the heaviest gales.

South-west or W.S.W. is the prevailing wind, and south-east is the fine weather quarter on the southern part of this coast—northward of cape Egmont; the north-west which blows directly into the roadstead of New Plymouth, does not often blow home; it gives sufficient warning, backing round from north-east and North, and is generally preceded by a swell.

North-west winds blow very hard for about 12 hours, and then change to W.S.W., afterwards to south-west.

From November to April the weather is fine. In June and July south-east winds prevail. Gales at any season seldom last more than forty-eight hours. Sometimes a north-west swell sets in without the wind blowing home.

The barometer rises for South and East winds, and falls for northerly and north-westerly, which is the rainy quarter.

The proportion of north-west to south-east winds is about seven to four,



which may be assumed as also the proportion of south-west winds to all others on the west coast.

On the north-west coast in the neighbourhood of Hokianga river and Kaipara harbour, westerly winds are the most frequent; it blows hardest from north-west to south-west, the heaviest gales from the latter quarter, and in the winter months. Easterly winds are more common in summer, and draw round to the south; they are looked for at the time of the new moon, and generally last three days. Most rain falls in July, August, and September; fogs prevail in October and November, but seldom last after 8 a.m.

#### 5. MIDDLE ISLAND.—EAST COAST.

On the eastern coast of the Middle island, between cape Campbell and Foveaux strait, the north-east sea breeze may be looked for during the summer months; and within a short distance of the coast a wind off the land during night, but not with the same degree of regularity as they are found on the eastern coast of the North island.

Strong winds from north-west and south-west are frequent, and south-east gales are not uncommon; the latter blow heavily, bring thick dirty weather and rain, and continue between two and three days.

About Lyttelton, nearly central in this district, we find the summer sea breezes blow from the north-east, with hazy weather, occasionally changing to north-west for two or three days. The summer sea breeze dies away at sunset, and is succeeded by a light south-west wind, springing up about midnight, which lasts until 9 a.m.

In winter the prevailing winds are south-east at sea, but at Lyttelton and Canterbury the wind is south-west, while at sea it is south-east. In spring and autumn the winds are variable from north-east for two or three days, with very fine weather; then light winds for a day, shifting to north-west, blowing a gale from 12 to 48 hours; then a sudden shift to south-west, strong wind and rain for three days, when it comes round again to north-east along shore.

Fortunately it seldom blows strong from east, but even light winds from that quarter produce a heavy swell in port Lyttelton. This wind is accompanied by fog and misty rain. The violent south-west wind in this harbour (off the land) is accompanied with more danger to shipping than any wind that has blown in. In December H.M.S. *Pandora* experienced a south-easter between Canterbury and Otago: it fell calm for an hour, when the S.S.E. wind came up suddenly, and with little warning it veered to S.S.W. This south-west wind corresponds to the south-eastern of Cook strait.

It is very necessary to be aware of the prognostics of the sudden changes

along this coast, especially the north-wester, which comes on at once to blow furiously; the most unmistakeable sign is a remarkable transparency of the atmosphere, which is very clear indeed.

The north-west wind of this district resembles the sirocco of the Mediterranean: it comes on suddenly, and changes the temperature in a few minutes from 12 to 20 degrees. This change in the temperature, perhaps, arises from the rapid melting of snow in crossing the southern Alps, or from crossing heated plains.

The south-west wind is preceded by heavy hard-edged dark cumuli in that quarter. At sea this is probably S.S.E.

Again, the mountains are clouded in a south-easter, and partially in a south-wester, while all distant objects, including the Kaikoras, are distinct, with a fine blue tint, on the approach of the north-west wind. The finest months are December, January, February, and March. Rains and gales are chiefly in June, July, and August. The rainy quarter is north-west to south-west. The hot north-wester in summer frequently terminates in wet: there is also a wet and dry south-wester. In autumn or winter the barometer rises very high, with light east winds, producing fogs and much rain lasting 10 or 14 days.

The barometer is very variable on this coast; its fluctuations amount almost to a puzzle on shore. It is supposed the lofty mountains must have some share in producing local pressure, as the mercury is frequently moving, though no apparent atmospheric disturbance takes place.\* The following remarks are specially applicable at sea:—In winter the mercury falls previously to a S.S.E. or south-west gale, but immediately before commencing it rises, and when at its greatest height the gale blows strongest. In winter such a gale brings continuous rain for three days: but in spring and autumn severe squalls, with rain, hail, and sleet, the glass remaining high, and it is succeeded by north-east wind and fine weather. The mercury falls before a north-west gale, especially if followed by a wet south-west wind; the change is often immediate. It is very low when snow falls, although without wind.

At Lyttelton the barometer has been very low for many days without any change; it has been at its highest with very bad weather, and soon after at its lowest with very fine weather. It appears that the cyclone north-easter does not occur above four times a year, then the rain from this quarter is heavy. The greatest fall of rain yet known in 24 hours was 2·14 inches in April 1853.

The uncertainty of the weather is shown to be remarkable by the following example:—The rain that fell in,—

April, 1852 - - - 3·09 inches.

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\* Similar effects have been noticed near Tierra del Fuego.

April, 1853 - - - 9·40 inches  
 April, 1854 - - - 1·08 „

The following Tables are from observations in 1852, 1853, and 1854, made at Christchurch, as registered between 9 a.m. and 4 p.m., 20 feet above sea level :—

## TEMPERATURE.

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum	52	52	52	45	37	32	31	33	39	44	46	51
Maximum	89	87	83	79	69	61	61	61	67	76	77	82

## BAROMETER.

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum	In. 29·15	In. 29·26	In. 29·07	In. 29·50	In. 29·02	In. 29·11	In. 29·07	In. 29·19	In. 29·14	In. 29·26	In. 29·25	In. 29·15
Maximum	30·18	30·09	30·31	30·50	30·33	30·43	30·42	30·50	30·21	30·26	30·27	30·14

## WINDS.

—	N.N.E. to N.N.W.	N.W. to W.	S.W.	S.E. to N.E.	Calm or Variable.	—
1852 -	4	20	112	119	110	—
1853 -	6	21	115	120	103	—
1854 -	5	27	99	151	83	—

At Otago no register appears to have been kept previous to 1854 ; the following information regarding the weather there is from the intelligent pilot, who resided sixteen years near the heads.

North winds are rare: the ordinary sea breeze is north-east; it seldom blows from the East: south-east winds are accompanied by thick hazy weather, but seldom blow home.

South winds do not blow strongly, unless they veer to S.S.W. and south-west.

The winds off the land are the strongest, and W.N.W. winds blow the hardest, the latter being at times a hot wind. The squalls from this quarter are heavy.

The heaviest gales are in November, often with large hailstones.

The dirtiest weather is in June and July. January is the hottest, and July the coldest month. Snow falls and lies on the ground for two or

three days in June, July, and August. South to south-east is the rainy quarter.

The pilot considered that there are about 30 days in the year when it would not be prudent to cross the bar because of the swell, which is worse in attempting to leave. He states that the year 1853 was a peculiarly dry season. It is curious that in that year there should have fallen at Canterbury nearly double the annual average amount of rain, and that in all other parts of New Zealand it was remarkably dry.

The effects on the barometer may be generally assumed as similar to those of Canterbury, allowing for  $2\frac{1}{2}^{\circ}$  higher latitude. At Otago there is much more fog.

#### 6.—FOVEAUX STRAIT AND SOUTH ISLAND.

Foveaux strait and the coasts of Stewart island are without doubt the most boisterous localities in New Zealand; heavy gales from north-west to south-west are the prevailing winds, and seem to blow without regard to seasons, at all times of the year, occasionally continuing for weeks without intermission. North-west winds are the most frequent in Foveaux strait, which seldom last less than four or five days, and often bring rain and thick dirty weather; thunder, which is not of common occurrence in New Zealand, is said to indicate that the gale will be of unusually long duration; the barometer falls on the approach of this wind, though it often continues to blow hard after the mercury has risen; on these occasions, however, it generally veers to south-west, and the weather clears. With a strong north-west or westerly wind in Foveaux strait, it is often from south-west on the eastern coast of Stewart island, and on the western coast of that island the north-west wind becomes N.N.W.

A strong south-east wind may be looked for about once in six weeks in the summer months, and perhaps twice in that period during June, July, August, and September, and generally occurs about the full or change of the moon; the barometer rises before one of these winds, and they often blow with great strength, bringing thick weather with drizzling rain; a heavy bank of clouds rising to the south-east, with rain, and the tops of the hills clothed with a white mist nearly to the horizon, are considered as certain indications.

Before a south-east gale, also, the groups of islands between Ruapuke and Stewart island appear much raised by refraction, but on going westward, should Solander island appear distorted from the same cause, the westerly wind will prevail over the easterly: a casual north-east or easterly wind with fine weather in the eastern entrance of the strait almost certainly turns to north-west before reaching the western entrance; the only wind which can be depended on to carry a vessel through is a strong south-easter.

The worst weather is said to occur in Foveaux strait in July.

During very fine weather the ordinary sea breeze of the east coast prevails as far south as the Traps rocks, but this must not often be looked for, and it is almost invariably met there by the N.N.W. wind of the west coast.

#### 7. MIDDLE ISLAND.—WEST COAST.

The north-west or N.N.W. wind is very constant on the south-west coast of the Middle island, until sufficiently far to the northward to be out of the influence of Foveaux strait, and the endeavour to round the south-west extreme from this cause, as well as a southerly current which prevails, is extremely tedious for a sailing vessel. When to the northward of West cape the difficulty is in a great measure overcome, as there is a port under the lee, and moreover south-west winds are of more common occurrence; it frequently, however, blows hard from both quarters. A falling barometer indicates a north-west wind, which brings rain and thick weather, while with that from south-west it is generally fine and clear.

Unless blowing very hard in the offing, the wind generally falls light or dies away within one or two miles of the high precipitous coast between the south-west extreme of the Middle island and Milford sound, but a strong gale blows home and direct up the inlets; rain is frequent in all the harbours of this coast, and a land wind will be found to draw out of them in the early morning, unless it is blowing strong from the westward outside. North-west gales are less frequent, and intervals of fine weather, accompanied by southerly or south-west winds, and attended with a high barometer, are by no means uncommon.

From Milford sound to the northward the prevailing winds are from north-west to south-west; the former frequently bring rain and thick weather, and as the shore is approached generally veer to the northward. South-west winds are fine and clear; rain is of very frequent occurrence and often lasts for several days together without intermission.

At the anchorage at Jackson bay it has been observed that northerly gales generally commence at N.N.E., with clear weather, veering to north-west with heavy squalls and thick rain; from this point the gale is most severe, and if disposed to last, will back round again to North. A shift to the south-west is generally preceded by a lull with heavy rain, and at the latter point again blows hard, but the gale is then of short duration, and soon subsides into a moderate breeze, with fine weather.

Gales are not so frequent here in summer, though their directions are much the same; south-west and W.S.W. winds then prevail.

On rounding cape Farewell with south or south-west winds, they almost invariably draw to the westward and north-west, and follow a vessel through Cook strait.

TABLE showing RAINFALL in North and Middle Islands, New Zealand.\*

Place.	Averages of Rainfall for the different Seasons of the Year, with the Mean Number of Days of Rain.										
	Mean Annual Rain-fall.	Spring.		Summer.		Autumn.		Winter.		Mean No. of Days on which Rain falls annually.	Period of observation.
		Sept., Oct., Novr.	Decr., Jan., Feby.	March, April, May.	June, July, August.						
Auckland -	Inches. 44·622	Inches. 11·081	Days. 45	Inches. 8·378	Days. 27	Inches. 11·009	Days. 37	Inches. 14·265	Days. 56	177	Years. 15
Taranaki -	58·584	17·088	42	10·974	27	14·133	30	17·199	47	146	12
Wellington -	50·091	12·148	35	9·685	27	12·666	33	16·021	46	146	10
Mean for North island.	51·119	13·422	40	9·679	27	12·602	33	15·828	49	156	
Nelson -	54·731	16·746	28	13·211	17	8·795	19	14·55	23	92	16
*Christchurch -	31·636	5·145	24	7·266	23	8·022	28	13·193	35	113	11
Dunedin -	32·896	8·129	44	9·428	41	7·943	38	7·253	46	178	15
Mean for Middle island.	39·747	10·006	32	9·968	27	8·253	27	11·665	31	127	
	51·119	13·422	40	9·679	27	12·602	33	15·828	49	156	
Mean for both	45·483	11·714	36	9·823	27	10·427	30	13·746	35	141	

\* The monthly averages for the amount of rain, and the number of days of rainfall, are only for 8 years, while the mean annual fall, and number of days, are for 11 years.

MEAN TEMPERATURE of AIR in Shade recorded at the Chief Towns in the North and Middle Islands, New Zealand.

Places :	Mean Annual Temperature.	Ditto for Spring. Sept., Oct., Novr.	Ditto for Summer. Decr., Jan., Feby.	Ditto for Autumn. March, April, May.	Ditto for Winter. June, July, August.	Period of Observation.
North island.						Years.
Auckland -	60·3	58·8	68·6	62·3	53·3	15
Taranaki -	56·8	55·9	64·2	57·4	49·5	12
Wellington -	55·7	54·6	63·6	56·7	47·9	10
Middle island.						
Nelson -	55·0	53·3	62·5	56·4	46·5	16
Christchurch -	55·1	55·5	61·4	55·9	44·5	11
Dunedin -	50·7	50·0	57·4	51·6	47·0	15
Mean -	55·6	54·6	62·9	56·7	48·1	—

From the annexed table it will be observed that in the North island the mean annual temperature for Auckland is the highest (60°·3) and that of Taranaki (56°·8) the next, while Wellington is the lowest (55·7). In the Middle island Christchurch (55·1) and Nelson show the highest mean annual temperature, Dunedin (50·7) very much lower. January and February, corresponding with July and August in England, are the two

\* From Remark Book of Staff Commander W. H. Sharp, H.M.S. *Liverpool*, 1870.

warmest months in New Zealand ; and July and August, corresponding to January and February in England, the two coldest, excepting at Nelson and Wellington, at which places the mean readings are lowest in June and July. The climate of London is  $7^{\circ}2$  colder than that of the North island, and  $3^{\circ}8$  colder than the Middle island of New Zealand ; and the difference between the mean annual temperature of the whole of New Zealand and that of London is  $5^{\circ}7$  ; the former being  $55^{\circ}7$ , the latter  $50^{\circ}$ .

The following are the means for the two warmest and the two coldest months in the year, in the several localities, with their differences :—

Auckland.	Taranaki.	Wellington.	Nelson.	Christchurch.	Dunedin.
69·6	64·7	64·6	63·6	65·2	58·0
53·1	49·3	47·8	45·9	44·3	43·2
16·5	15·4	16·8	17·7	20·9	14·8

From which we find that the average difference between the mean temperature of the warmest and coldest month of the year in New Zealand is  $17^{\circ}$ . At Rome it is  $27^{\circ}$  ; at Montpellier,  $33^{\circ}$  ; at Milan,  $38^{\circ}$  ; and at Jersey,  $22^{\circ}$ .

## CHAPTER XI.

OUTLYING ISLANDS SOUTH AND EAST OF NEW ZEALAND, VIZ.  
AUCKLAND, CAMPBELL, ANTIPODES, BOUNTY, AND THE CHATHAM  
ISLANDS.

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 AUCKLAND ISLANDS.
 

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## VARIATION IN 1875.

Auckland islands, 17° 40' East. | Chatham islands, 15° East.

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THE Auckland islands, a group in the South Pacific ocean, to the southward of New Zealand, lying between the parallels of about 50° 30' and 51° S., and the meridians of 165° 55' and 166° 15' E., were discovered, during a whaling voyage, on the 18th August 1806, by Captain Abraham Bristow, in the ship *Ocean*, a vessel belonging to Samuel Enderby, Esq. The discoverer, who named the group after Lord Auckland, again visited the islands in 1807, and then took formal possession of them.\*

The group consists of one large and several smaller islands, separated by narrow channels, and extend over a space of about 30 miles in length north and south, by nearly 15 miles in breadth. The land is mountainous as it ranges from 950 feet at Hooker hills in the north to 2,000 feet at Adams island on the south. The eastern side of the main island appears to be deeply indented, but the western side is unbroken, having no opening but the narrow separation of Adams island (a channel fit only for small steam vessels), the coast line being backed by hills varying from 600 to 1,500 feet above the sea.

The Auckland islands have been thus described by Dr. Hooker, of H.M.S. *Erebus*, who visited them in 1840 during the Antarctic voyage of Sir James C. Ross:—

“ Possessing no mountains rising to the limits of perpetual snow, and few rocks or precipices, the whole land seemed covered with vegetation. A low forest skirts all the shores, succeeded by a broad belt of brushwood, above which, to the summits of the hills, extend grassy slopes. On a closer inspection of the forest, it is found to be composed of a dense thicket of stag-headed trees, so gnarled and stunted by the violence of the gales as to afford an excellent shelter for a luxuriant undergrowth of bright green feathery ferns, and several gay flowered herbs.”

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\* See Admiralty chart of Auckland and Campbell islands No. 1,114. Scale *m* = various.



In connection with the same group, Mr. McCormack, surgeon of H.M.S. *Erebus*, writing in 1840, states:—

“ There is no species of land animal with the exception of the domestic pig introduced several years ago, and now in a wild state. The birds are all New Zealand species, from which country these islands have unquestionably been colonised by the feathered tribe. Of land birds there are not more than seven or eight species, and of these the beautiful ‘Tooe’ bird of New Zealand, and a small olive green species allied to *Meliphagida*, are the chief choristers of the woods, which are in many places almost impenetrable, the trees and underwood forming dense thickets.”

“ The water birds consist of a New Zealand species of duck (*teal*), a mergus (*merganser*), a species of cormorant (*phalarococorax*), a snipe, a penguin, and two kinds of gull, the black-backed and small ash-backed, frequenting the bays in great abundance. The albatross (*diomedea exulans*) was breeding in considerable numbers on the tops of the cliffs to the north-west of the harbour (port Ross or Sarah’s Bosom). Their nest is formed upon a small mound of earth, of withered grass and leaves matted together, above six feet in circumference at the base, and about 18 inches in height ; it is the joint labour of the male and female birds.”

“ Like most of the petrel tribe, the albatross lays only one egg, of pure white, varying in weight from 15 to 21 ounces. In one instance only, out of above 100 nests that were examined, were two eggs found in the same nest. Its greatest enemy is a fierce raptorial gull, very strongly resembling the skud gull, both in its predatory habits and general aspect, and is probably an undescribed species. Several kinds of petrel were breeding in holes underground, and on the sides of the cliffs bounding the bays. A solitary ring-plover was seen, but no specimens obtained.”

“ The pigs that were left on the island\* have become very numerous ; their food consists of the *Arabia polaris*, one of the most beautiful and singular of the vegetable productions of the island it inhabits, growing in large orbicular masses on rocks and banks near the sea or amongst the dense and gloomy vegetation of the woods ; its copious bright green foliage and large umbels of waxy flowers have a most striking appearance.”

From the eminent services rendered to geographical science in the south polar regions, and to further those commercial enterprises in which the Messrs. Enderby for many years had so largely engaged, the group was granted by the Government to them for the head-quarters of a Whale Fishery Company. Mr. Charles Enderby, with an efficient staff, accordingly formed a settlement in the early part of 1850, in port Ross ; the company, however, was not successful, and after a few years the enterprise was abandoned.

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\* By Captain Bristow in 1807.

The following information relating to the means of existence in the event of wreck on the shores of these islands has been furnished by Mr. Charles Enderby :—"On the two islands of Auckland and Enderby there are a vast number of pigs. I have seen (when standing on the cliffs of the latter island) as many as one hundred at a time feeding on the rocks beneath ; but those were by no means the only pigs on that island, for I have likewise seen as many as six splendid black boars running in the woods of apparently a different breed from those first mentioned ; but although Enderby island is only 3 miles in length by one in width, I have never been able to find their hiding places or to capture one of them."

"On the larger island of Auckland pigs are yet more numerous, and are of two descriptions, viz., those feeding on the sea shore, the flesh of which is very unpalatable until kept on vegetable food for two or three months, and those feeding on the hills or in the woods on a plant called by the New Zealanders 'cooper cooper,' (which I presume is that described by Dr. Hooker in his Antarctic voyage as the *Pleurophyllum criniferum* or that to which it is closely allied, the *Pleurophyllum speciosum*,) which has leaves two feet in length by one in width, and this he mentions as the plant with its roots on which the pigs feed, and that it is to be found in great abundance in many places on the borders of woods and on the hills. The flesh of these pigs I found excellent."

"I imagine these pigs would be difficult to take, although so numerous, without firearms, unless some means be devised for snaring them. The stalks of the plant on which they feed are covered with silky hairs, which should be scraped off ; when cooked these stalks are not unpalatable, something resembling rhubarb, and are commonly eaten by the New Zealanders. Of other vegetables I can say little ; there should, however, be the remains of vegetables I planted on Enderby island and other places if not rooted up by the pigs."\*

"There are a number of dogs on Auckland island (now in a wild state) lost by the New Zealanders, and these, with the hawks, which are large and numerous, would effectually destroy any fowls or rabbits which might be placed there. When I quitted the settlement in 1853 the dogs were confined to the one island above mentioned, but as the New Zealanders were left on the island for many months after the settlement was broken up I am unable to say if any of their dogs were left on the other islands. Seals are to be found the greater part of the year in considerable numbers, particularly on the shore and in the woods of the southern harbours, and

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\* Dépôts of provisions have been established by the Colonial Government for the benefit of shipwrecked people at the following places: south side of Erebus cove; sandy bay on Enderby island; Saddle or Norman inlet; and at Carnley harbour; the two former were examined and replenished by the *Cossack*, 1873. Numbers of rabbits were seen on Enderby island, but no ducks there or at port Laurie.—Remarks by Nav. Lieut. E. O. Hallett, R.N., H.M.S. *Cossack*, 1873.

are easily captured by striking them sharply on the nose ; but in May (the pupping season) the females come on shore in vast numbers, and the pups are by no means bad eating."

"Ducks of three descriptions are common at the Auckland island, one kind of which cannot apparently fly; they are in the greatest abundance in the southern harbours. Small birds are numerous and not difficult to kill with stones or sticks, and are not bad food; amongst them may be mentioned the parson bird and the paroquet. The common shag are numerous and to be found in all parts, but I have particularly noticed them on a point of rocks facing Ocean islet. The mutton birds frequent the island in vast numbers at certain seasons; they are about the size of a pheasant and excellent eating but fat, and obtained at night by lighting a fire, which they approach on the wing, and are knocked down with sticks."

"On Rose island there should now be a great number of rabbits, and wood-hens (probably the *Troglodite* Rail) which I placed there. I had rabbits in the first instance on a small piece of detached land between Auckland and Rose island, but they multiplied so rapidly that there was not sufficient food for them. When I left the Aucklands there were a considerable number of cattle on Enderby island, but I have been told that many of them have been killed."

"Of fish there is a great abundance throughout the year, mostly rock cod, which may be caught by hook and line from the shore, generally in places where there is seaweed.\* There is a large bed of cockles at the head of Laurie harbour (port Ross), the shells of which are from 1½ to 2 inches in diameter; they are about two inches below the surface at low water, and a dozen of them may be taken up at a time with a spade; other beds of cockles were reported to me as having been found in like positions and equally numerous in several of the southern harbours."

"I may observe that there is a seaweed, which the New Zealanders partly split open and make into a bag, which is capable of holding from seven to ten gallons of water, in which are put a large number of mutton birds that float in their own oil and which keep for a long time thus prepared. These bags might be inflated, and would bear the weight of a man in the water."

"The climate though boisterous and subject to much rain is healthy (although attempts have been made to prove the contrary); cases of rheumatism occurred as might have been expected situated as the persons were who accompanied me to those islands, numbering together with New Zealanders and seamen about 300, but no death arising from the climate or from disease contracted on shore occurred in 3½ years whilst I was there.

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\* During the visit of H.M.S. *Blanche* to these islands in February 1874, rock cod were caught, but their bodies found to be full of worms; therefore it was presumed that at that time of the year this fish is not in season. The provision depôts above mentioned were visited, and found in good order. Enderby island was overrun with black rabbits.

The temperature is very equable, the snow never lying more than three days on the ground except on the summit of the hills."

"The winds are violent and of long duration; the gales are mostly from the north-west, although I experienced two from the eastward unusually strong." They mostly commence at North with a falling barometer, veer gradually to West and W.S.W., and at times blow most violently; when the barometer begins to rise the gale ceases at South or S.S.E.

Captain Benjamin Morrell, writing in 1830, states:—"The climate is mild, temperate, and salubrious. In the month of July, the dead of winter, the weather is mild as respects cold, the thermometer never being lower than 38° in the valleys, and the trees at the same time retain their verdure as if it was midsummer. In December and January the thermometer was 78°."

The whaling season is in April and May.

**BRISTOW ROCK.**—We commence the description of the coasts and harbours of these islands by describing Bristow rock, an off-lying danger northward of Enderby island, directly in the track of vessels rounding the north end of the group. Mr. Chas. J. Polkinghorne, Master, H.M.S. *Fantome*, 1852, who approached this danger in a large whale boat during a heavy sea, says:—"I could not obtain soundings or get nearer to it than half a cable, as the sea was breaking and thrown up from the centre like a pillar or spout of a whale to a height of from 20 to 30 feet. I should think there could not be more than 5 or 6 feet water on it."

The position of the rock when *breaking* was determined by Mr. Polkinghorne by bearings taken from the shore, at the following points:—From the north-east end of Auckland island, the rock bore N. by E.,—mount Eden being also in line—from the highest part or centre of Enderby island N. by W.  $\frac{1}{4}$  W.; and from the north-east point of Enderby island N.N.W.  $\frac{1}{2}$  W. By the present chart these bearings would place the danger about  $3\frac{1}{2}$  miles from Enderby island, but as the relative points from which they were taken may not be accurately placed on the chart, and as the compass might have been affected by the magnetic nature of the ground, a feature prominent on the shores of this group, the position of the rock must be considered only as approximate, and as it was not seen either by the *Terror*, in 1840, or from the *Fantome*, in 1852, when those vessels were making for port Ross, nor from the *Victoria*\* when rounding the north-end of Enderby island, or from the summit of this island in

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\* H.M. Colonial steam vessel *Victoria*, Commander W. H. Norman, was sent by the Provincial Governments of Australia in October 1865, in search of shipwrecked people at the Auckland and other outlying islands, south and east of New Zealand; consequent on the wreck of the *Grafton* at the Auckland islands, and subsequent escape of her commander Mr. Thomas Musgrave and a portion of the crew, (after a detention of twenty months,) to New Zealand.

1865, it is necessary to observe the greatest caution when navigating in this locality.

H.M.S. *Cossack* having visited the islands in February, 1873, the following information as to the position of the Bristow rock, is given by Navigating Lieutenant E. O. Hallett.—At 6.30 a.m. saw the Bristow rock breaking heavily, bearing W.N.W., with mount Eden bearing S.W.  $\frac{1}{4}$  S., and the north extreme of Enderby island W. b. S.; after steaming in and watching for another break it bore N.W. by W.  $\frac{1}{4}$  W.; Ocean island bore S.W. by W.  $\frac{1}{4}$  W., and the break again seen, just open of the north-east extreme of Enderby island, N.W. b. N.; this places the rock a little over  $2\frac{1}{2}$  miles from the north extreme of Enderby island, and for the present this position is given on the chart. The rock was seen the same day from Enderby island; three days afterwards the *Cossack* steamed along the north shore of the island, at a distance of about  $1\frac{1}{2}$  miles, passing between the rock and Enderby island, but nothing was seen of it, which fully accounts for its not being seen by the several ships above mentioned.

The tide rips off the north point of Enderby island extend a long way to the north-east, at times to a distance of 12 miles, and to a stranger have a most alarming appearance. The flood sets to the N.N.E., and the ebb to the southward.

**NORTH-WEST CAPE.**—The North-west cape is a remarkable bold high headland, with a rocky islet and a curious conical rock off it; just eastward of the cape is a dark looking promontory, called Black head, with a deep cavernous indentation at its base.

**WEST COAST.**—The whole western coast of the island is one continuous perpendicular wall from 200 to 800 feet high. In some places the cliffs are split and riven asunder, and remarkable pointed isolated rocks, from 100 to 300 feet high, are formed close in under the main cliff, and cannot be perceived excepting when very close in, but not one accessible landing place is to be seen for a distance of about 25 miles.

**Disappointment island** is small in extent, high, rocky, and inaccessible; the island and its outlying rocks lie off the middle of a bight 2 miles from the shore, and just outside the line between the north-west and south-west capes of the main group.

“The Disappointment islands, at a distance from the northward, present the appearance of three sugar loaf mountains, and the whole western coast has a most inhospitable, rugged, and ironbound appearance; it is washed by the heavy sea thrown in by the prevailing westerly gales. A strong current sets between the islands and the main, and the passage is unsafe even in fine weather for any other than a large whale boat, although there are 40 fathoms water between the island and the main.”\*

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\* Mr. Charles J. Polkinghorne, Master H.M.S. *Fantome*, 1852.

Near the south end of the coast a passage was found into Carnley harbour, west of Monumental islet, and the *Victoria* entered in safety. This passage is not more than 100 yards wide, and the least water found was  $3\frac{1}{2}$  fathoms (half-ebb) on a rocky ridge running directly across, with a sudden overfall into 13 fathoms towards the sea, causing a very ugly and dangerous rip. Inside, the water was smooth, and the *Victoria* anchored in  $4\frac{1}{2}$  fathoms water above Figure of Eight island in the North arm. A sailing vessel, bound to Carnley harbour from the westward, might derive advantage by taking this entrance; but it could only be done with the wind from between south-west and south-east, and should not be attempted unless with a strong breeze at slack high water (which is about noon full and change), and by a person who has a knowledge of the place. Between North-west cape and Disappointment island, several pinnacle islets and rocks, some of the latter awash, were seen, the coast inside being formed of high perpendicular cliffs.

**PORT ROSS or SARAH'S BOSOM HARBOUR.\***—The entrance to this port, situated at the north-eastern end of the group, is between Enderby island on the north and Ewing island on the south. It is about one mile wide and runs in nearly 7 miles to the south-westward, narrowing to a third of a mile at its head, and having from 20 fathoms water at the entrance to  $3\frac{1}{2}$  fathoms at its inner part. The shores of this large inlet are indented with several bays, surrounded by basaltic rocks easy of approach; the whole encircled by elevated land, clothed with trees from the seaboard to the summit; the soil of volcanic formation is covered with a thick layer of vegetable debris, producing a dense growth of large ferns.

**ENDERBY ISLAND**, the north-eastern of the group, is about  $2\frac{1}{4}$  miles in length east and west, of no great elevation, covered with vegetation, the trees in general being 15 or 20 feet, with others 70 feet high; and the island is well supplied with water. Between it and the main coast is Rose island, separated by narrow boat channels, through which the tide sets very strong, the sea occasionally breaking right across. Sandy bay, on the south side of Enderby island, and about  $1\frac{1}{4}$  miles from its east extreme, is a convenient temporary anchorage, as it is protected from all winds except those from the south-eastward, and the holding ground is tenacious clay. — When Captain Norman, of the *Victoria*, visited the island, several sea-lions were seen and three killed; English grass was growing in great profusion, as also vegetables in a wild state. A few goats and rabbits were landed, which at once took to the English grass. The *Victoria* steamed slowly round the island, and in a small bay on the north side several seals were observed. The vessel kept close in shore, within half a mile, both leads going, no bottom with 10 fathoms.

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\* See plan on Admiralty chart of port Ross on Sarah's Bosom harbour, No. 1114; scale,  $m = 2$  inches.

“ On rounding the north-east cape of Enderby island, we passed through some strong whirlpools, occasioned by the meeting of the tides off this point ; and although we did not find soundings with our ordinary hand lines, it is by no means improbable that some shoals or rocky patches may have some influence in producing these strong and dangerous eddies. As we opened the harbour, the squalls came down from the western hills with much violence, threatening to blow us out to sea again ; and it required the utmost vigilance and activity of the officers and crew in beating up, at times, to maintain the ground we had gained. There is, however, ample space, and no concealed dangers, the belts of sea-weed, which line the shores and rocks, point out the shallow or dangerous parts.”\*

**Deas head**, about three-quarters of a mile S.W. of Rose island, is an interesting feature, formed of basaltic columns 300 feet high, which are highly magnetic.

**Terror Cove**, three quarters of a mile southward of Deas head, is where Sir James Ross anchored the *Terror* and fixed his observatory in 1840. In the old charts this is Sarah's Bosom, as named by Captain Bristow after his ship, in his second visit to these islands in 1807. Erebus cove is south of Terror cove, separated by a projecting point. The establishment of the Southern Whale Fishery was on the south side of this latter cove. On the shore westward of this the beach is good for landing, and the shore being level is suitable for wharfage, &c. Vessels may lie in these coves nearly land-locked. Water and wood are in abundance : winged game, &c. plentiful. The results of Sir James Ross gave for his observatory station (on the north side of the mouth of a small stream in Terror cove), lat.  $50^{\circ} 32' 30''$  S., long.  $166^{\circ} 12' 34''$  East of Greenwich. Dip of the needle,  $73^{\circ} 12'$ . The average temperature from 20th November to 12th December 1840 was  $45\frac{1}{2}^{\circ}$ .†

In October 1865, numerous trees, such as the ash, oak, and pine, with seeds of the turnip, carrot, lettuce, parsnip, pumpkin, &c., were planted on the south side of Erebus cove, by Captain Norman. Four goats (three females and one male), were also landed. No traces of pigs were seen here, or northward of Chambres inlet, as they appear to keep about the middle of the island ; but a dog was seen.‡

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\* Captain Sir James Clark Ross, 1840.

† See plan :—Port Ross, or Sarah's Bosom harbour, on chart No. 1,114, scale  $m = 2$  inches.

‡ During the stay of the survivors of the crew of the *General Grant*, wrecked on the west side of the island in May 1866, a bull-dog (ears cut) with others came near their hut (Musgrave's hut in the North Arm), and the impression was that these dogs had not been long on the island. Also, when on a visit to the north-west point of the mainland, to a bay known to sealers as Faith harbour, for the purpose of procuring planking, the first pig tracks were observed, and a sucker was captured ; on a second visit another was caught. The method adopted for securing these animals was by a hook of half-

**TIDES.**—It is high-water, full and change, in Terror cove, at 12 h.; springs rise about 3 feet. A remarkable oscillation of the tide when near the time of high-water was observed; after rising to nearly its height, the tide would fall 2 or 3 inches, and then rise again between 3 and 4 inches, so as to exceed its former height rather more than an inch. This irregular movement generally occupied rather more than an hour, of which the fall continued about 20 minutes, and the rise again upwards of 50 minutes of the interval.

**Shoe Island**, in the middle of the harbour, and lying off Terror cove, is about a cable in length, picturesque, bold, highly magnetic, and steep-to.

**Laurie Harbour**, at the head of port Ross or Sarah's Bosom harbour, is nearly 2 miles in length in a W.S.W. and E.N.E. direction, with an average breadth of about 4 cables. Shallow water and weeds extend eastward a long quarter of a mile from the point which separates the harbour from Erebus cove, to which a berth should be given. It is more secure than Terror cove, being entirely landlocked; a large stream of water runs into the sea at its head, and here appears to be a suitable place for a settlement. The rocks are covered with limpets, and small fish of various kinds are to be caught in abundance amongst the kelp. A few grey ducks, snipes, cormorants, and the common shag are seen here; the land birds are excellent eating, especially the hawks.

**Dundas and Green Islets**, are two small islets  $1\frac{1}{2}$  miles apart and connected by a reef, lying nearly  $1\frac{1}{4}$  miles south-east of Ewing island on the south side of entrance to port Ross. Parts of the reef are covered at high water, but it generally shows by the breakers which extend a mile north-eastward of the low outer islet. Mariners approaching port Ross from the eastward should carefully avoid this danger as in thick weather a vessel might be in the breakers without having seen the land.

**Adams Island**, the southernmost of the Auckland group, rises about 2,000 feet above the sea, and faces the south end of Auckland or the main island, forming between a channel the whole breadth of the islands called Adams strait or Carnley harbour.

The western entrance to Carnley harbour is very narrow and only fit for small steamers; there is a large whirlpool in the narrowest part. Soundings vary from 13 to  $3\frac{1}{2}$  fathoms.

**North Arm and Musgrave Harbour.**—The eastern entrance to Adams strait about 5 miles to the N.E. of South cape of Adams island is formed by two bluff points; thence the strait runs westward about 4 miles to the entrance of an irregular inlet which continues northward and north-west

inch iron, similar to an ordinary fish hook without barb, a foot long. To this a line made of flax was attached (flax grows but sparingly on the island); the hook was then slightly tied to the end of a pole 10 feet long, and the end of the rope held with the pole. They then crept towards the pigs when feeding, hooked and caught them by the line. By this process a number were secured. These hooks were left at the huts on Enderby island.



into Auckland island, one branch of which is named Musgrave harbour, and another North Arm ; the latter forms a fine basin with room for several vessels, and its head may be about 5 miles from the mouth of the inlet. The water in this end of the strait and in the inlet is deep, but a vessel may anchor in the harbours in as little as 4 fathoms, clay bottom. In bad weather the wind comes down over the high land in severe squalls and whirlwinds, which are dangerous for boats under sail.

Captain Norman landed here six Muscovy ducks. Several young trees were planted and canary seed sown at the head of Musgrave harbour. The thermometer from the 19th to the 27th of the month ranged from 34° to 44°, and the barometer varied from 28·52 to 29·50, blowing a part of the time a strong gale.

**Musgrave Inlet**, on the east side of Auckland island, is about 5 miles deep and runs in westward and W.S.W. to its head. Its entrance is on the north side of a point, with a large black looking flat rock off it, about 10 feet above water. There are 20 fathoms a quarter of a mile from the point, and the same depth up to the entrance of the inlet. Under the round bluff head, on the south side, is a 9-fathom patch marked by kelp, and about 2 miles within there is a bank running straight across the inlet ; it has 6 fathoms water within 50 yards of the south side, the ground is even and the depth increases to 8 fathoms at the same distance from the north side ; the distance across is about 3 cables, it is marked by kelp, and a vessel may anchor here, but at the head of the inlet there is anchorage in from 12 to 7 fathoms water, perfectly landlocked, and the breadth across about 2 cables.\*

**Hanfield Inlet**, south-west of Musgrave inlet, has two arms ; in the northern, there is a small sandy beach about 50 feet in length, and the only sand seen. The *Victoria* moored here in October 1865, in 7 fathoms water. The inlet is open to the north-east, but the wind rarely blows from this quarter. Turnips were growing close to the water, in the sandy soil. There is a magnificent waterfall in the southern arm.

**SMITH HARBOUR**, north of Musgrave inlet, first runs westward and then southward, forming a good harbour for a steamer or small vessel. It is some distance to the head, and its narrowest part is a quarter of a mile wide. The anchorage is land-locked and safe, with from 9 to 3 fathoms water. The head of the inlet is within 200 or 300 yards of Musgrave inlet. A fine stream of water runs into it, and here in 1865 marks of pigs were observed ; some of these animals must have been of large size, for many of the footprints were nearly as large as those of a deer, and the ground was rooted up in every direction.

To the northward of Smith harbour are Norman, Griffith, Granger, and

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\* The account of the east coast of Auckland island is from the journal of Capt. Thomas Musgrave, 1865, late of the schooner *Grafton*, and hence the name of this inlet.

Chambres inlets, all running more or less into the land and open to the eastward. The *Victoria* passed midway between Dundas islet and the point west of it.

#### CAMPBELL ISLAND.

Variation in 1874.

18° 35' East.

**CAMPBELL ISLAND** was discovered in 1810 by Frederick Hazelburgh, master of the brig *Perseverance*, owned by Mr. Robert Campbell, of Sydney. He describes the island as being 30 miles in circumference, the country as mountainous, and that several good harbours existed, of which two on the eastern side were to be preferred. The southernmost of these harbours he named after his vessel.\*

**PERSEVERANCE HARBOUR.**—The entrance to this harbour is half a mile wide, thence it runs in westward 3 miles, and then south-westward to its head. The shores on either side are steep and rise abruptly to between 800 and 900 feet. The highest hill seen from the harbour is on its north side (Lyall hill), and has an elevation of 1,500 feet. The hills have a more desolate appearance than those of the Auckland islands, being less wooded, but although abundance of wood exists in the sheltered places, the trees nowhere attain so great a height as in those islands. The trees especially indicate, by their prostrate position, the prevailing power of the westerly gales. The occurrence of sudden and violent rushes of wind is a remarkable and characteristic phenomenon of all the islands situated in about this latitude. It is similarly observed at Kerguelen island, and at the Auckland islands.†

In the outer part of the harbour the water is too deep for convenient anchorage, but in the inner part, which is completely landlocked, there is abundant room for a large number of ships to lie in security. The shores are skirted by a belt of sea-weed, and are free from danger excepting Shoal point, on the south shore, where, at the turn to the inner part of the harbour, H.M.S. *Terror* grounded in 1840. Water is abundant.

The observation spot of Sir James Ross, on the beach, just east of Shoal point, is in lat. 52° 33' 26" S., long. 169° 8' 41" east of Greenwich. Dip of the needle 73° 53'.

**TIDES.**—It is high water, full and change, in Perseverance harbour at 12h.; springs rise 3½ feet. There are the same irregularities of tide here as at port Ross, Auckland islands.

The *Victoria* visited this island on the 29th of October 1865, in search of shipwrecked people, anchored at midnight in Perseverance harbour, and so obtained shelter from a gale then threatening. Bar. 28°·94. Therm. 46°.

\* See Admiralty plan:—South or Perseverance harbour, scale  $m=1$  inch; and sketch of Campbell island on sheet of plans, No. 1,114.

† The description of this island is by Captain Sir James C. Ross, 1840.

Captain Norman in his journal states :—"Started three parties at 8 a.m. to ascend the hills around us, for the purpose of overlooking the shores of the island, and examining the interior. The report furnished by the parties on their return to the ship was to the effect that, from the various heights excellent views had been obtained, but that no signs of any wrecks, or of the presence of anyone having been living on the island lately, were seen."

"The travelling through the interior was, in some parts, very difficult; the soil is similar to that of the Auckland islands—a soft boggy peat; the vegetation consisting of a long wiry grass, growing in tufts, and a dense low scrub; no tracks of any animals were seen by either of the parties. Much labour and exertion are required to force a way through the dense scrub and grass, and the presence of a number of deep holes, discovered only by finding one's self at the bottom. Some of the points could be reached only by climbing barefooted up precipitous rocks, some of which were of considerable height. Dr. Chambers, of the *Victoria*, planted some English trees, consisting of six oaks, six elms, and one ash. Three pigs, game-fowls, geese, and guinea-fowls were landed, at the head of the harbour."

The following description of Campbell island is from remarks by Navigating Lieut. Hallett H.M.S. *Cossack* :—1873, 7.30 a.m. (February 11). Sighted Campbell island bearing east; the first land seen was three large rocks on the west side of the island, these stood out boldly through the mist which hung over the land. The north-west rock is about 300 feet high, close to which, on the south side, is another rock about 200 feet, and much smaller, the two other high rocks are each about 300 feet high. Off the south-west point of the island, is a still larger and higher rock or islet (600 feet); inside these were a number of smaller rocks, one very conspicuous to the north-westward of the south-west islet, resembling a cloaked figure on a pedestal, most likely giving the name, Monument harbour, to the indentation in the land near it; these rocks were passed at a distance of about 2 miles, no outlying dangers were to be seen.

After rounding the south-west point, and the rock or islet off it, the ship steamed along the land at a distance of about 2 miles on north-easterly courses, when a dark perpendicular headland was seen bearing N.N.W. Course was altered to N. by W., and a deep indentation in the land showed itself, which proved to be Perseverance harbour.

The *Cossack* anchored in Perseverance harbour in 10 fathoms, Beeman hill N.W.  $\frac{1}{2}$  N. During the stay of the ship (3 days) it blew hard from north to N.N.W., ending in south-west, heavy squalls coming down from the hills; in one of these the ship dragged her anchor; shifted berth farther out, anchoring in 12 fathoms, Beeman hill N.W. by W.  $\frac{1}{4}$  W.

After leaving Perseverance harbour, and when about 10 miles distant from the land, with north-east point of the island bearing W. by N., the south-west point S.W.  $\frac{1}{2}$  W., and Erebus point S.W. by W.  $\frac{1}{4}$  W., the entrance

to the harbour was immediately under what appears to be the highest part of the island.

The south part of the island is much higher than the north; the south-west point is high ending in a bluff 300 feet high, with the before-mentioned islet off it. North of Erebus point about half a mile is a dark perpendicular bluff about 300 feet high, this is the easternmost point of the island, from this the land falls back to the north-east point, off this point there is a conspicuous rock, the point itself is jagged, and when bearing N.W. appears like steps of unequal length and height, the north point is perpendicular and about 400 feet high.

There is a depôt of provisions in Perseverance harbour, the position of which is marked by a white staff.\*

North harbour, or Penguin bay on the east side of Campbell island may be known by Cossack rock, a small round island which lies off the north point of the entrance; the bay extends to the westward for 3 miles, and increases in width towards the head, terminating in two creeks, the southern of which inclines to W.S.W. At the head of the bay is a fine valley, through which runs a considerable stream of water, the largest in the island; vegetation appears more healthy here than elsewhere on the island, on account of it being less exposed to westerly winds. Penguin bay is easier of access than port Perseverance, and easterly winds seldom blow there; it seems more frequented than the other anchorages by the whalers, of whom there are many traces; there is anchorage in all parts of the bay, the depth being from  $5\frac{1}{2}$  to  $8\frac{1}{2}$  fathoms.

The bays on the west side of Campbell island (Boat harbour and Monument harbour of the plan) afford no shelter, and the coast presents a desolate and storm-beaten appearance.

#### ANTIPODES ISLANDS.

Variation in 1875.

$17^{\circ} 25'$  East.

**ANTIPODES ISLANDS.**— This isolated group consists of several<sup>1</sup> detached rocky islands lying nearly north and south over a space of 4 to 5 miles. The largest island is apparently above 1,000 feet high; the perpendicular cliffs of the whole group varying from 200 to 600 feet, and all the islets appear safe to approach or to pass between. Landing appears impracticable. The *Victoria* visited the group in November 1865, and Commander Norman places Antipodes island in lat.  $49^{\circ} 42'$  S., long.  $170^{\circ} 43'$  E., thus verifying the position by several recent navigators. Experiencing heavy gales from the West and W.N.W., the ship was

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\* During the visit of H.M.S. *Blanche* in February 1874 this depôt was examined and found in good order. Water is abundant at the head of the bays in the harbour; no pigs were seen, but geese and wild duck were seen at the head of the harbour.

kept under the lee of the group, and 60 fathoms water found within half a cable of the shore.\*

The following is from remarks by Navigating Lieut. Hallett, of H.M.S. *Cossack*, 1873.—Sighted Antipodes islands bearing N.E.  $\frac{1}{2}$  E., passed along the north shore of the large island at a distance of from one to two miles, it has most barren and inhospitable appearance. Off the west side of the largest island is a rock having a large arch in the centre, and off the north-west point is a high pinnacle rock with apparently deep water between it and the island; close to the north-east point is an island seemingly an extinct crater. The cliffs are partially covered with a dark green moss-like vegetation; there are numerous large caverns in the face of the cliffs.

The only place where it would be likely to effect a landing, is a little to the southward of the north-east extreme of the island, there, the cliff having fallen away has formed a shelving point on which the sea seemed to break lightly, it is sheltered also from the prevailing winds.

The position of the small island, at the north-east point of Antipodes island, is  $49^{\circ} 40' S.$ ,  $178^{\circ} 49' 45'' E.$

#### BOUNTY ISLANDS.

Variation in 1875.

$17^{\circ} 0' E.$

**BOUNTY ISLANDS.**—This little cluster of rocky islets—thirteen in number, and without verdure—cover a space of  $3\frac{1}{2}$  miles east and west, by  $1\frac{1}{2}$  miles north and south. The western is the largest and may be seen at a distance of 20 miles. At 10 miles South of the eastern island there are 75 fathoms water, fine white sand; and 18 miles E.S.E. of this position, 104 fathoms, fine brimstone coloured sand.†

Captain Bligh, R.N., the discoverer in 1788, and from whom the above description is taken, placed the group in lat.  $47^{\circ} 44' S.$ , long.  $179^{\circ} 7' E.$

The *Victoria*, Commander Norman, visited the Bounty islands in November 1865, when outlying sunken rocks very dangerous to approach were found about  $3\frac{1}{2}$  miles off the W.N.W. side. With the group bearing N.N.W.  $2\frac{1}{2}$  miles, soundings in 83 fathoms, shells and sand, were obtained, and at 8 miles distant, 95 fathoms, fine sand of brimstone colour. The group, on examination, was found to consist of twenty-four small islets from 100 to 300 feet high (with 40 fathoms water half a cable off the north-east side), destitute of vegetation, without landing, and the resort of a great number of penguins and other sea birds. Captain Norman places the group in lat.  $47^{\circ} 50' S.$ , long.  $179^{\circ} 0' E.$

Remarks on the Bounty islands, by Navigating Lieut. B. J. Jackson, of H.M.S. *Rosario*, 1870.—I counted 20 in all, but half of them were not more than 10 or 15 feet out of water; the largest, which is the westernmost but one, covers from 8 to 10 acres.

\* See Admiralty chart No. 2463, Norfolk island to  $65^{\circ} S.$   $d = 0.7.$

† See Admiralty chart No. 2468, Norfolk island to  $65^{\circ} S.$ ; scale  $d = 0.7.$

The group might be divided into two clusters, with a passage between them; there is a rock nearly in the centre, over which the sea breaking and the spray thrown up, presented a grand appearance; there is also a blow hole in one of the western cluster which throws clouds of spray some 300 feet high. The sea was seen breaking from three to four miles to the westward, probably over the sunken rock reported by Commander Norman of the colonial steamer *Victoria*.

**Caution.**—There is also a sunken rock to the southward of the group, bearing from the western extreme of the group S.  $\frac{1}{2}$  W., and from the eastern extreme S.W.  $\frac{1}{2}$  S., distant  $3\frac{1}{2}$  miles, or  $2\frac{8}{10}$  miles off shore. These rocks are exceedingly dangerous, and great care should be taken in approaching the islands in thick weather, as they sometimes do not break for 5 or 10 minutes.

The eastern islet, which is one of the highest, is 280 feet high. Lat.  $17^{\circ} 46' S.$ , long.  $178^{\circ} 56' 44''$ .

The following soundings were obtained; with western extreme of islands N.E. by E.,  $2\frac{1}{2}$  miles, 71 fathoms, fine light sand and stones; eastern extreme N.N.W.  $\frac{1}{2}$  W., 2 miles, 84 fathoms, yellow sand and shells; west extreme, south, 3 miles, 93 fathoms, fine light sand and granite; centre of group N.E. by E.  $\frac{1}{2}$  E.,  $4\frac{1}{2}$  miles, 98 fathoms, fine light sand and shells; eastern extreme, S.W.  $\frac{1}{2}$  S.,  $2\frac{1}{2}$  miles, 89 fathoms, fine light sand and shells; centre of group, N.E. by E.  $\frac{1}{2}$  E., 12 miles, 110 fathoms; with the western extreme of group bearing N.E. by E.,  $2\frac{1}{2}$  miles, on looking over the side, the ship appeared to be in shoal water with a white sandy bottom; on getting a cast of the lead 71 fathoms, light sand and shells, was found.

The paucity of birds about the islands was remarkable.

#### CHATHAM ISLANDS.

Variation in 1875.

Point Munnings,  $15^{\circ} 0' E.$

This group, included between the parallels of  $43^{\circ} 25'$  and  $44^{\circ} 20' S.$ , and the meridians of  $176^{\circ} 10'$  and  $177^{\circ} 15' W.$ , and about 365 miles eastward of cape Palliser, Cook strait, New Zealand, consists of three islands—the largest, named Ware-kauri by the natives, and Chatham island by Europeans; Rangi-haute or Pitt island; and the third and smallest, named Rangatira,—as also several detached small islets and rocks. They were discovered on the 29th November 1791, by Lièut. William R. Broughton, in command of H.M. brig *Chatham*, and the following description is extracted from his narrative:—\*

\* See Admiralty chart No. 2468, Norfolk island to  $65^{\circ} S.$ , scale  $d = 0.7$ .

Also Admiralty chart, No. 1,417, Chatham islands, Waitangi, Hutt, and Kangaroo ports, scale  $\left\{ \begin{array}{l} D E \\ 2 \end{array} \right\} \begin{array}{l} m = 0.2 \\ m = 4.0 \end{array}$ .

“Early in the morning low land was discovered between the bearings of N.E. and E.N.E., when the vessel was in 40 fathoms water. When the north-west point of this low land—named point Alison after the man who fortunately saw it—bore S.  $\frac{3}{4}$  E. distant about 9 miles, the depth was 38 fathoms, sand and shells. A remarkably rugged, rocky mountain obtained the name of mount Patterson. The interior land was of moderate height, rising gradually, and forming several peaked hills, which at a distance have the appearance of islands.”

“From point Alison to mount Patterson the shore is low and covered with wood, from thence to an abrupt cape eastward was a continued white beach, on which some sandy cliffs and black rocks were interspersed, apparently detached from the shore. To the eastward of these rocks, between them and a flat projecting point, the land seemed to form a bay open to the westward. From this point to the cape, a distance of about 2 miles, the cliffs are covered with wood and coarse grass. These cliffs are of moderate height, composed of a reddish clay mixed with black rocks. The above cape forms a conspicuous headland, and is the northernmost of the island. I called it cape Young.”

“We steered from cape Young E. b. N., keeping between 2 and 3 miles from the coast, with regular soundings from 25 to 22 fathoms. The shore is a continued white, sandy beach, on which the surf ran very high. Some high land, rising gradually from the beach and covered with wood, extends about 4 miles to the eastward of the cape. After passing this land, we opened the several hills over the low land we had seen in the morning, and could discern that many of them were covered like our heaths in England, but destitute of trees.”

“The beach is interrupted at unequal distances by projecting rocky points covered with wood. After sailing about 10 leagues, we came abreast of a small sandy bay. Water was seen over the beach, and the country had the appearance of being very pleasant. With our glasses we perceived some people hauling up a canoe, and several others behind the rocks in the bay. We came to an anchor about one mile from the shore in 20 fathoms water, sandy and rocky bottom. The eastern point bore by compass N. 78° E. and cape Young W. 12° S.; the eastern point from our anchorage proved to be the termination of the island, to which I gave the name of point Munnings.”

“Having reached the shore without any interruption, we displayed the union flag, turned a turf, and took possession of the island, which I named Chatham island (in honour of the Earl of Chatham), in the name of His Majesty King George the Third, under the presumption of our being the first discoverers.”

“We got under weight with a fresh gale at south-west; on passing point Munnings, which is the north-east extremity of the island, it was seen to be a low peninsula. From the bay which I called Skirmish bay to point

Munnings, the shore is low, rocky, and clothed with wood. Pursued our way to the N.E. In the course of the following day passed many patches of seaweed, and saw some port Egmont hens, and several oceanic birds."

"The natives were found to be of a middling size, some stoutly made, well limbed, and fleshy. Their hair, both of the head and beard, was black, and by some was worn long, and they were dressed in seal skins or mats neatly made. They seemed a cheerful race, our conversation frequently exciting violent bursts of laughter amongst them. On our first landing their surprise and exclamation can hardly be imagined." Although unprovoked, they made an assault on Lieut. Broughton and his crew upon his return to the boat, and a skirmish ensued, in which one of the natives was killed. This officer says: "I have to lament that the hostility of its inhabitants rendered the melancholy fate that attended one of them unavoidable, and prevented our researches extending further than the beach, and the immediate entrance of the adjoining wood."

From the time of the discovery of these islands they had not been visited for many years, except by whalers, when their existence becoming known to the New Zealanders, a number of the latter during the native wars fled thither from port Nicholson. On their arrival they conquered and enslaved the islanders, who, although belonging to the Polynesian race and speaking a dialect similar to that of the New Zealanders, appeared to have had nothing in common with them.

Dr. Dieffenbach, who visited the islands in 1840, thus writes:—"The sealers who first visited the islands—and I met with some who had been there ten years ago—found the natives numerous and healthy, in number at least 1,200, and they were received by them with a hearty welcome. What a wretched change has taken place in the short interval which has since elapsed!—a change occasioned by the importation of about 800 New Zealanders, brought thither by a European ship in 1830 or 1831. Not ninety of the original natives now survive in the whole group, and in a short time every trace of them will be lost, as even the New Zealanders have disdained to intermarry with them."

**WARE-KAURI**, the largest island, is of irregular formation, extending in a W.S.W. and E.N.E. direction about 38 miles, and from north to south 25 miles, with its coast line deeply indented by large bays. The ensuing description is abridged from the travels of Dr. Dieffenbach, who visited these islands in 1840:—"The surface in the northern half of the island is generally undulating, deep, and boggy; in the hollows it is often marshy; but from its height above the sea the land can everywhere be easily drained. This promises to be highly productive, and equally fit for grain or pasturage. Wherever the superfluous water has been carried off by a

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\* See Journal of the Royal Geographical Society, vol. ii., p. 195.



natural outlet, a rich vegetation of fern and New Zealand flax (*phormium tenax*) has sprung up, giving additional firmness to the soil by decayed leaves, and yielding a rich harvest to the native planter. This is particularly the case on the low hills above the sea shore, which are well wooded, and encircle the island with a verdant zone.

Where these hills are sandy, the decayed leaves cast by the trees have formed a light, black soil, which the natives prefer for agriculture. The conical hills, which rest on a volcanic rock, have very rich soil in their neighbourhood, which is generally covered with a vegetation of fern and trees, agreeably mixed together, and these fertile spots are like so many oases rising from the surrounding bog. On the west side of Wanga-roa bay, and at other places between Maunga-nui and Emo-kawa, the soil has been set on fire by some cause or other, and is burning slowly beneath the surface; the temperature, although neither flames nor fire are visible, is much raised. "Te ahi kai kai te one one" (the fire consumes the earth), say the natives; and, in consequence of this slow combustion, which had begun before the New Zealand colonists settled here, six years ago, and may, indeed, be traced to a much earlier period, the soil in the neighbourhood is gradually sinking.

The vegetation of these places is extremely vigorous, though the soil is perfectly dry. A phenomenon like this, of a burning soil, is not unparalleled, as in several places beds of coal, accidentally ignited, have continued to burn slowly for a long series of years; this is therefore explicable, without any reference to volcanic agency. What has been already said applies almost exclusively to the northern part of the island, which presents another remarkable feature, viz., several lakes usually surrounded by gently sloping hills. They are most frequent near the northern coast, and are usually one or two miles in circumference. There are some also not far from the beach near the western coast; the largest of which is at the head of Waitangi bay, and about 6 miles in circumference. A river named Te Manga-pe, from 6 to 8 yards broad, drains this lake, and is tributary to another river, which enters Waitangi harbour. The hills surrounding these lakes are slightly wooded, and form a beautiful feature in the Ware-kauri landscape. The shores of the Manga-pe river are low, and, at some places, its water is stagnant.

This lake is separated by a range of low hills from Te Wanga, the largest lake in the island, which is, however, brackish. It is about 25 miles long, and 6 or 7 broad, and therefore occupies a large portion of the whole island, and is surrounded by hills either wooded or boggy. On the eastern side it is separated from the sea by low sand-hills about 100 yards broad. At one place the intervening hills disappear, and between the lake and the sea there is only a low sandy beach; the level of the lake is about 2 feet above high-water mark, and according to the natives the sea never encroaches upon it. The water is only slightly brackish, probably from

infiltration, as it is supplied by two large streams, otherwise the water would be fresh. These streams descend in a serpentine course from a range of low hills which run from north to south to the southern extremity of the island, and although only a few yards broad, they are deep and rapid, discharging their waters into a long branch of the lake. The Wanga occasionally empties its waters into the sea, by breaking over the low barriers. The land at its southern extremity is then left dry to the extent of several miles, and the way from Wai-keri, a native settlement on the eastern shore, to Waitangi harbour on the western is much shortened.

The Mangatu, or Nairn, the principal stream which flows into Waitangi bay, rises from a range of hills in the southern part of the island, near the two rivers, which discharge themselves into lake Wanga. The bar at its mouth is passable by a boat only at high water; but beyond the bar the river is navigable for about 3 miles, at low water, as the depth is often 12 feet, though the channel is narrow, it then becomes a mere rivulet, winding its way through a deep valley from east to west. The length of the Mangatu is about 12 miles; at its mouth the left shore is higher than the right, and both are wooded or covered with fern.

The larger and better part of the island is that to the southward of Waitangi harbour. Here it has an undulating surface, is not so boggy as other parts of the island, and is either covered with an open forest of moderate sized trees, or with high fern, where the land can be brought into cultivation with little labour. In general the soil is extremely fertile, and preferred by the natives to that of New Zealand. The winds which sweep over these islands are not sufficiently violent to injure vegetation; and it is only in a few peculiarly exposed places on the coast that the shrubs appear stunted.

In the months of May, June, and July, Dr. Dieffenbach found the climate mild and agreeable. After 8 a.m. the thermometer was never below 45° or above 60°, though it was then the winter season. He mentions as being often obliged to sleep in the open air, covered only by a light cloak; and although it was sometimes wet with dew in the morning, never experienced inconvenience. Being surrounded by the sea the air is always moist and cool, but never misty, the vapour being carried off by the constant breezes. Even during winter the sky is generally cloudless and of the deepest blue.

The changes of temperature are neither so sudden nor so frequent as in New Zealand, where they result from the neighbourhood of high mountains capped with snow. Chatham islands being at a distance from any land, the heat and cold are both moderated by the sea breeze; but there is no want of rain, and showers are experienced for a few hours every week. The prevailing winds are north-east and south-west. The climate appears very favourable to European constitutions.

**The COAST.**—Waitangi or Petre bay, on the south-west side of the island, is about 13 miles wide between the boundary points, whence the coast falls back 10 miles in a semicircular form. The land here has an undulating surface of small elevation, but rising to the north-west into detached hills, some of which are of a regular pyramidal shape. With the exception of the Waka-kaiwa, two hillocks at the south-west point of the island, no hills are visible in that direction, but the land rises gradually from the rocky shore, and clothed with verdure to the water's edge, the top of the slope spreading out into a level or undulating surface.

On approaching the inner part of the bay a red bluff will be seen which forms the northern point of port Waitangi, and 3 miles northward of it is another bluff of the same description, with a sandy beach backed by low hills between them. From the northern bluff the beach becomes again sandy for some miles, and then continues rocky to the north-west point of the island, being indented by four small bays, the three inner of which are close together. These bays are open to the south-eastward.

The northern side of the island forms several wide open bays; to the westward the shore is flat, and the headlands of the bays run out in long wooded tongues of land. About 10 miles from the north-west point there is a group of irregular hills, of little elevation, called Maunga-nui (the high mountain), which terminates in a rocky precipice from the foot of which runs out a spit with a level beach. This spit forms the western termination of a bay, whose eastern boundary, distant about 10 miles, is a hilly promontory with steep sides; the shore between is a beach of fine sand backed generally by sand-hills, which are wooded to a short distance inland, and are either shelving or cut down into cliffs by the action of the waves. In the middle of this bay four needle-shaped rocks lie about a cable from the shore.

To the eastward of the promontory (cape Young), the shore retreats again, and runs about 15 miles to the eastward, with a broad beach and low wooded hills; rocks are scattered along shore, which are uncovered at low water. The entrance to Kangaroo or Skirmish bay, near the east end of the island, is partly obstructed by rocks. The outermost rock off its eastern point is covered, but the water occasionally breaks on it. The rocks above water, off the western point, extend to the middle of the entrance, and are terminated by a sunken rock a quarter of a mile distant. A reef named the Lure lies half a mile northward of the west point.

The east end of the island is rocky, and reefs extend a long way to the eastward from Wakuru islet, which is connected to the main rocks between uncovering at low water. From the islet the east coast of the island trends southward, and forms a bay nearly 2 miles long, with a broad sandy beach backed by low wooded hills. Rocks, most of them only visible at low water, are everywhere scattered along shore, and with easterly winds heavy breakers extend several miles from the land. The southern point of

the above bay is rocky, and thence a long deep bay extends to the south-east point of the island. Sand-hills are thrown up along the coast, and stunted shrubs cover them on the weather side. The south-east point is a hilly promontory covered with wood.

**Anchorage.**—The best anchorages on this side of the island are about 6 miles from the north-east extremity, where a boat can land at all times; and near the wooded promontory at the south-east extreme of the island, the cape offering some shelter from south-westerly winds. Easterly winds, however, often set in suddenly.

The southern coast is abrupt and precipitous; the land on the summit of the cliffs is level and covered with trees. Small streamlets trickle down the cliffs, and clothe their face with herbage.

**MATA-KETAKI or MOUNT PATTERSON.**—At the north-west end of the island, a chain of hills succeeds to the low undulating surface near the coast. Some of them are regular pyramids with their base running east and west; others have a more irregular shape, and consist of rounded stony masses piled on the top of a mound of earth. All these hills have a volcanic origin, and are formed of either dense and firm, or cellular basalt, the cells of which are either empty or filled with white decomposed carbonate of lime. None of these hills are more than 800 feet in height. The westernmost of them is called Mata-Ketaki or mount Patterson, and the extremity of the group nearest the shore forms a perpendicular cliff 100 feet high, but separated from the sea by a flat beach  $1\frac{1}{2}$  or 2 miles in breadth.

Near the head of Wangaroa or port Hutt, there is a small hill of some elevation, called Emo-kawa or Iwa-kawa, 3 miles from which, near the head of Wanga-tche, is Wakapai or mount Dieffenbach, the most regular pyramid, and apparently the highest of all. Only a few miles to the N.N.E. of it is Wai-papa, likewise pyramidal. The last and that from which the original name of the island is derived, is Ware-Kauri; it rises about 2 miles from the northern shore, and 15 miles from the west end of the island, it is wooded and consists of several steep declivities.

**Rangi-Tutahi or Sisters** are two small rocky islands near each other, about 100 feet high, flat on the top with steep sides, covered with scanty brushwood, and much frequented by birds. These islands, from their resemblance to each other, Lieut. Broughton named the Sisters. A line of breakers runs off about 5 miles to the North-West reef.

The following Remarks on the Chatham islands are by Captain C. W. Hope, of H.M.S. *Brisk*, June 1865, who describes the chart of these islands as both imperfect and erroneous, especially as regards the southern portion of the group:—\*

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\* See Admiralty chart of the Chatham islands, No. 1,417, compiled from a plan by M. Fournier, and from a sketch by Mr. Heaphy in 1840.

**Making the Land.**—On making the Great Chatham island from the westward mount Maunganui is very conspicuous, being a high rugged hill with a broken irregular outline, appearing to form the north extreme of land; but on approaching nearer, Patterson point, a long low projection off which there are dangerous reefs extending a mile or more, will be recognised. Mount Dieffenbach will be seen to the right of Maunganui, which is a sharp pointed pyramidal hill said to be the highest on the island, but Maunganui looks higher. There are other peaks resembling Dieffenbach, but lower.

**CUBA CHANNEL.**—The *Brisk* approached Alison point on an East course, and then passed through Cuba channel into Petre bay. The coast from Alison point to Somes point appears fringed with rock, and should not be approached nearer than one mile. The sea breaking on West reef may be seen 8 or 10 miles off from the mast head, and on a nearer approach patches of the reef are visible above water. The reef seems to be correctly placed on the chart, but appears to extend somewhat farther in a north-west direction from the dry part than is there laid down. There is, however, a channel at least 3 miles wide between the reef and Somes point, through which steaming at half speed no bottom could be obtained with 10 fathoms, and there were no indications of any other dangers.

**PETRE BAY.**—The only anchorages to be recommended in Petre bay are Wangaroa or port Hutt, and port Waitangi, the other bays being exposed to south and south-west winds. On steaming along the southern shore of Petre bay nothing was seen of the Heaphy shoal, and it was stated that it had no existence. There was a heavy swell running, but no appearance of a break anywhere off this shore, except upon the Jenny reef, which appears to be rather less in extent than the chart shows.

**Wangaroa or Port Hutt** is sheltered from all winds, but it is very confined, and as with strong west and south-west winds there is a heavy sea at the entrance, a vessel should anchor as far in as possible. The entrance may be easily recognised by the view on the chart.\* With the nib or hummock on mount Iwa-Kawa open to the eastward of Maunganui, as shown in the sketch, the harbour is open, and the white sandy beach at its head will be seen. There are likewise sandy beaches at the head of the two bays to the eastward of Wangaroa, therefore care must be taken not to mistake between them.

The sea breaking on the rocks on either side of the entrance to Wangaroa marks the dangers, and it is only necessary to keep midway between and steer straight in on a N.W. by W. course. A patch of kelp stretches partly across the entrance from Napper reef, but there is deep

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\* See plan of port Hutt, and view on chart, No. 1,417.

water where it lies, and the *Brisk* passed through it. The reef off Gordon point must be avoided, but the outer edge of the kelp there marks the deep water.

The *Brisk* anchored inside the line from Gordon point to Evans point in 5 fathoms, coarse sand and shells, with the centre of the little cove behind Evans point bearing N.E. A large vessel should moor if intending to stay any time, as there is scarcely room at single anchor to swing all round unless the anchor were dropped exactly in the centre of the harbour.

**Tide.**—It is high water, full and change, at port Hutt at 6h. 50.m ; rise, 6 feet.

**Water.**—There is a stream of excellent water at the north-west corner of the harbour, but no fire-wood or supplies of any kind are to be had here, the country for miles round being bleak open moorland intersected by small lakes and swamps. The only habitations are two Maori huts on the west side at Howard bay.

**PORT WAITANGI** is the principal place in the Chatham islands. The resident magistrate lives here, as also several other Europeans. Fresh meat, poultry, and vegetables may be obtained in abundance and very cheap ; the potatoes, for which these islands are celebrated, are very fine, and at times a large quantity is exported to New Zealand and Australia. The land in the neighbourhood is excellent ; wheat is cultivated, and answers well, and all kinds of English fruits and vegetables come to perfection. The lakes abound with wild ducks, and there are also curlew plover, and pigeons, with abundance of wild pigs all over the island.

The anchorage at port Waitangi is not a safe one for large vessels during westerly gales. Vessels drawing not more than 12 or 13 feet may ride out south-west gales by anchoring close in with Hanson point bearing S.W. or S.W. by W. ; they will then be in a measure sheltered from the heavy sea, but will experience a rolling swell that will try their cables.

With a gale from north-west this is decidedly a dangerous anchorage. The *Brisk* experienced a heavy south-west gale while at anchor here in May 1865, with Clatchie point bearing W.S.W. in 6 fathoms, fine black sand. The gale lasted 48 hours ; one cable parted, and the vessel was in a very critical position, a high breaking sea running, and a strong offset from the shore keeping the ship at times broadside to wind and sea. An American whaler lying farther in also parted a cable, and the crew left her, expecting to be wrecked, but she rode it out safely, as did also a schooner lying close under Hanson point. A shoal having 5 fathoms water on it, is said to lie  $1\frac{1}{2}$  miles to the northward of the anchorage, but the exact spot is uncertain. It is, however, known to the natives, who go there to fish.

In 1864, 14 vessels amounting to 5,155 tons entered inwards with

cargoes; and 15 vessels amounting to 5,506 tons cleared outwards with cargoes. "For several years this port has been visited by ships for fuel, provisions, and water, which can easily be procured. During my stay there was never less than 5 vessels in the harbour; and in the whole whaling season of 1840, 30 vessels came hither for refreshments."\*

**The COAST** from Durham point to Evêque point is high, bold, and apparently clear of danger. Evêque point has close behind it a remarkable hill with a cleft rock on the top exactly like a Bishop's mitre, from whence the name is given.

**Pitt Strait.**—The *Brisk* passed about  $1\frac{1}{2}$  miles to the northward of the Sentry reef, which appears to be correctly placed, but is smaller than laid down on the chart. It is entirely under water, but the sea breaks violently on it.

There is said to be a rock some little distance from the shore, 2 or 3 miles westward of cape Fournier, but it is out of the ordinary track of vessels passing through Pitt strait, and nothing was seen of it. The residents stated that, with the exception of this rock and Sentry reef, Pitt strait is entirely free from danger, the rocks lying off the west and south-west sides of Pitt island being high and steep.

**Pitt Island** and its surrounding islets and rocks are most incorrectly laid down on the chart; in fact, with the exception of Sentry reef, the entire chart south of capes Evêque and Fournier is erroneous. The north end of Pitt island bears S.E. by S., 9 miles from cape Fournier.†

The north end of the island forms a bay about  $1\frac{1}{2}$  miles wide and half a mile deep, where there is good anchorage with southerly winds. From the centre of this bay Evêque point bore W.  $\frac{3}{4}$  N. and cape Fournier N.W. by N., and assuming that these two capes are correctly laid down on the chart, this point in the bay would be in lat.  $44^{\circ} 13' S.$ , long.  $176^{\circ} 29' W.$  This latitude is at all events nearly correct, as it agreed with observations taken at noon. Mr. Hunt, an Englishman, who has resided for twenty-five years on the island, lives in this bay; he farms a great portion of the island, and gains a livelihood by supplying whalers with fresh provisions of all sorts. He also acts as pilot, and it is chiefly from the local knowledge thus gained that Captain Hope derived such information as did not come under his own immediate notice.

On the east side of Pitt island there is an anchorage much frequented by whalers, where vessels may ride well sheltered from westerly gales; and on the west side there is good anchorage with northerly and easterly winds in a bay behind a very high and precipitous island called by the residents the "Castle." This island, which is probably The Fort of

\* Dr. Dieffenbach writing in 1840.

† Captain C. W. Hope, H.M.S. *Brisk*, 1867.

the present chart, occupies more nearly the position of The Outposts islets as there laid down; this latter, a very remarkable sharp-pointed serrated rock, is further to the south-west; and the extreme rock of this group, named the Sail rock from its extraordinary resemblance to a boat with a gigantic lug sail, lies considerably to the south-west of its position on the chart. This group of rocks is very remarkable: the "Castle" is flat topped with perpendicular precipitous sides, 300 or 400 feet high. The *Brisk* was too far off to judge of the positions of the rocks off the south end of the island.

**Supplies.**—Abundance of fresh meat, potatoes, and vegetables may be obtained at Pitt island, as also poultry, milk, and butter. The island is thickly wooded; the soil very fertile, and, as at the great island, all kinds of European fruits, &c. grow and thrive. Wheat is also cultivated, but not in quantity sufficient for exportation.

**Bertier Rock.**—On leaving the north end of Pitt island, the *Brisk* steered N.N.E., which took her 4 or 5 miles to the northward of Bertier rock, a flat-topped islet about 150 feet high. This rock lies about E.N.E. 16 miles from cape Fournier, and is nearly on the parallel of 44° S., and has hence obtained the local name of "The Forty-fours."

**Round Island** bears about E. by N.  $\frac{1}{2}$  N. 7 miles from north extreme of Pitt island.

**THREE ROCKS.**—The existence of the three rocks laid down in lat. 44° 20' S., long. 176° 3' W., is considered doubtful; their present position on the chart places them E.S.E. 26 miles from cape Fournier, the S.E. point of Chatham island. The position of the Star Quay reef is also doubtful.

### MACQUARIE ISLAND.

This island has a breadth of 5 or 6 miles, is high and rugged, and seems covered with verdure, but which really is long tufted grass. The highest peak is from 1,200 to 1,500 feet high, without tree or shrub on it; there is no sheltered landing place for a boat, the coast being rugged and surf-bound, and is tenanted with myriads of sea birds, penguins, and albatrosses. The south end of this island is in lat. 54° 55' S., long. 158° 56' E. Off this end a reef extends three-quarters of a mile.\*

**Bishop and Clerk** are rocks which lie to the southward of Macquarie island, in lat. 55° 16' S., long. 158° 55' E.\*

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\* From Findlay's Directory for the South Pacific ocean, 3rd edition, 1871. 34323.



**Judge and Clerk** are two large naked rocks lying to the northward of Macquarie island, in lat.  $54^{\circ} 22' S.$ ,  $159^{\circ} 10' E.$ \*

#### EMERALD ISLAND.

The existence of this island is very doubtful; the ship *Emerald* in Dec. 1821, lat.  $57^{\circ} 30' S.$ , long.  $162^{\circ} 12' E.$ , saw the resemblance of an island, very high, with peaked mountains. This supposed site was passed by the United States expedition in 1841, without seeing any indication of land.\*

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\* Findlay's Directory for the South Pacific ocean, 3rd edition, 1871.

**TABLE OF POSITIONS.—NEW ZEALAND.**  
**FROM THE SURVEYS OF HER MAJESTY'S SHIPS**  
**ACHERON AND PANDORA, 1848-55.**

NOTE.—The Longitudes of these positions have been adapted to the Meridian of Fort Macquarie, Sydney, New South Wales :\* assumed in 151° 14' 0" East from Greenwich, on the authority of the late Lieut. Roper, R.N. See Papers on Maritime Longitudes (Nautical Magazine) and Tables of Maritime Positions.

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.		East.		H.W. F. & C.	Rise.
<b>NORTH ISLAND.</b>							
		°	'	°	'	h. m.	feet.
Three Kings island	N.E. island, N.E. extreme	34	6 20	172	9 45	8 0	7springs
" "	S.W. island, West extreme	34	9 30	172	1 30		
Cape Maria Van Diemen	Cape islet - - -	34	28 30	172	38 40	8 0	7 "
North cape - -	Cape islet - - -	34	25 7	173	4 30	7 0	7 "
Parenga-renga harb.	Kohau or Coal point -	34	31 0	173	1 50	7 54	7 "
Ohora river - -	Repi-repi point - -	34	50 0	173	10 10	8 48	
Rangaounou, or Awanui River - }	Tekotiatia point - -	34	53 12	173	18 34	7 44	7 "
Cape Kara Kara -	Cape extreme - - -	34	47 20	173	25 20		
Monganui harbour	Whites point - - -	35	0 20	173	33 35	8 15	7 to 5
Stephenson island -	N.W. extreme - - -	34	57 45	173	47 30		
Wangaroa harbour	Peach island - - -	35	1 44	173	46 44	8 15	7springs
Cavalli islands -	Great island, N.E. extreme	34	59 30	173	58 45	8 0	7 "
Bay of islands -	Motu Mea islet - -	35	17 0	174	7 2	7 15	6 to 9
" "	Cape Brett (Piercy island)	35	10 30	174	21 10		
Wangaruru harbour	Grove point - - -	35	23 48	174	22 20	7 10	7 to 9
Poor Knights islands	North island, North point	35	28 30	174	44 40		
Tutukaka harbour	North head - - -	35	37 54	174	34 20	7 0	7 to 9
Bream head - -	Extreme - - -	35	52 15	174	37 30		
Wangari harbour -	Lort point - - -	35	51 9	174	32 10	7 0	7 to 9
Moko-Hinou islands	North-West islet - -	35	54 45	175	5 20		

\* This important meridian appears to be yet open to further investigation ; the late Admiral P. P. King, from numerous observations, considered it to be in 151° 15' 25" ; the late Captains Blackwood and Stanley, for their surveys in Australia, adopted 151° 14' 50", as reduced from the longitude of Paramatta observatory given in the Nautical Almanac, which Captain Denham, for his operations in the Pacific ocean (1859) also employed. Captain J. L. Stokes, for H.M.S. *Acheron's* surveys, adopted 151° 15' 30" ; an analysis of documents in the Hydrographic Office, embracing observations made between the years 1788 and 1851, by numerous navigators and astronomers, places fort Macquarie in 151° 15' 5" E.

Garden island, the usual place of observation, lies 0° 0' 47" E. of fort Macquarie.

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.	East.	H.W. F. & C.	Rise.		
<b>NORTH ISLAND—continued.</b>							
		° ' "	° ' "	h. m.	feet.		
Great Barrier island	Aiguilles, or Needles point	36 1 15	175 26 30				
" "	Nagle cove - - -	36 8 48	175 20 35	6 25	7 to 10		
" "	Cape Barrier, extreme -	36 21 50	175 33 0				
Rodney point	Extreme - - -	36 16 40	174 51 10				
Kawau island	{ Bon Accord harbour, Momono jetty - - }	36 26 0	174 50 15	6 30	7 to 10		
Auckland harbour	Depôt point - - -	36 50 5	174 49 10	7 5	9 to 11		
Coromandel harbour	Tuhua island - - -	36 48 35	175 25 30	7 0			
Castle hill	Summit (1,610 feet) -	36 48 25	175 35 0				
Cape Colville	North point - - -	36 28 20	175 22 0				
Cuvier island	Highest peak - - -	36 26 30	175 48 20				
Mercury islands	{ East Island ( <i>Wakahau</i> ); North cliff - - }	36 36 15	175 58 20				
Mercury bay	{ Huki-huki pah, entrance of Mangrove river - }	36 48 44	175 44 36	7 21	5 to 7		
Alderman islands	East island - - -	36 56 15	176 7 40				
Kati-Kati river	North head - - -	37 26 40	176 0 30				
Mayor island	Highest peak (410 feet) -	37 15 40	176 15 15	7 45			
Tauranga harbour	Monganui Mt. (apex 860ft.)	37 36 25	176 11 10	7 10	4½ to 6		
Astrolabe reef	Centre (dries 4 feet L.W.)	37 30 45	176 26 45	7 30			
Motiti island	North point - - -	37 34 40	176 25 30				
Plate island ( <i>Mo</i> <i>tunau</i> )	Centre (166 feet high) -	37 38 15	176 34 0				
Maketu	Town point - - -	37 43 0	176 28 30				
Whale I. or Motu Hora	Highest peak (1,167 feet)	37 50 15	176 59 30				
Opitiki river	Mission house - - -	37 58 0	177 18 0	7 0	7 springs		
White island	Summit (863 feet) - -	37 30 0	177 11 45	7 30			
Mount Edgcumbe	East summit (2,575 feet)	38 6 0	176 45 0				
Tehaka point	Outer extreme - - -	37 42 45	177 41 45	6 30	9 "		
Runaway cape	Extreme - - -	37 30 45	178 0 30	9 16	7 "		
Hicks bay	Motakawa, or Long point	37 32 20	178 21 15	9 0	7 "		
East cape	East Cape islet (420 feet)	37 40 0	178 36 5	8 55	7 "		
Open bay	North point - - -	37 58 20	178 23 10				
Tolago bay	Motu-Heka islet - -	38 20 50	178 21 10	8 50			
Gable-end Foreland	The White Gable - -	38 31 45	178 18 20	8 0			
Ariel rocks	Centre of reef - - -	38 43 40	178 18 30	8 0			
Poverty bay	Young Nicks head - -	38 45 0	177 59 25	6 5	5 to 7		
Mahia peninsula	Table cape (extreme) -	39 6 0	178 1 0				

Place.	Particular Spot.	Latitude. South.	Longitude. East.	Tides.	
				H.W. F. & C.	Rise.
<b>NORTH ISLAND—continued.</b>					
		° ' "	° ' "	h. m.	feet.
Mahia peninsula	- Portland island, So. extreme	39 17 40	177 53 5	7 45	
Hawke bay	- Ahuriri harbr. Maori Pah	39 28 44	176 55 10	7 50	3 springs
" "	- { Long point anchorage, Moemoto head - - }	39 8 0	177 51 30		
Cape Kidnappers	- Extreme - - -	39 38 0	177 7 40		
Cape Turnagain	- East extreme - - -	40 29 30	176 38 30	7 0	
Castle point	- Extreme - - -	40 54 30	176 14 20		
Flat point	- Extreme - - -	41 15 10	175 58 30		
Cape Palliser	- Extreme - - -	41 36 50	175 17 0	6 0	
Taurakira head	- Extreme - - -	41 26 5	174 56 5		
Port Nicholson	- Pencarrow light - -	41 21 40	174 52 0		
" "	- Pipitea point - - -	41 16 40	174 47 53	4 30	3 to 5
" "	- Observatory* - - -	41 16 57	174 47 10		
Cape Terawitti	- Extreme - - -	41 17 15	174 38 15		
Mana island	- Anchorage point - -	41 5 51	174 48 5	7 0	6 to 8
Kapiti island	- Long point - - -	40 50 0	174 58 25		
" "	- Mayhew islet - - -	40 53 30	174 55 15	9 0	6 springs
Manawatu river	- North entrance point -	40 27 10	175 14 40	10 0	6 to 8
Rangitiki river	- North entrance - - -	40 17 30	175 14 45		
Wanganui river	- North head - - -	39 57 20	175 1 0	10 15	6 to 8
Waimate Pah	- Summit - - -	35 35 40	174 10 0		
Cape Egmont	- Extreme - - -	39 17 0	173 46 0	9 30	
Mount Egmont	- Summit (8,270 feet) -	39 18 0	174 4 55		
New Plymouth	- Flag-staff - - -	39 3 35	174 5 31	9 30	9 to 12
Mokau river	- Entrance - - -	38 42 30	174 38 45		
Albatross point	- North extreme - - -	38 6 10	174 43 30		
Kawhia harbour	- South head - - -	38 4 50	174 49 0	9 30	12springs
Gannet island	- Summit (80 feet) - -	37 57 0	174 35 0		
Aotea harbour	- South head - - -	37 59 35	174 51 0	10 0	12 to 9½
Whaingaroa harbour	- South entrance point -	37 46 22	174 53 15	9 50	12 "
Waikato river	- Maraitai village - -	37 24 20	174 47 20	9 30	9 to 12
Manukau harbour	- { Paratutai (North head) flag-staff - - - }	37 3 0	174 32 10	9 30	10 to 13
" "	- Onehunga (South point) -	36 56 15	174 48 0	10 50	9 to 14
Kaipara harbour	- South head (Okaka) - -	36 25 10	174 14 33	10 55	8 to 10
" "	- North Entrance head -	36 24 20	174 7 0		
" "	- { Watering place, Wairoa branch - - - }	36 19 35	174 11 30	10 50	8 to 11

\* The longitude of the Wellington Observatory in the triangulation of the province of Wellington adopted in 1872 was 174° 48' 50" E.

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.	East.	H.W. F. & C.	Rise.		
<b>NORTH ISLAND—continued.</b>							
		° ' "	° ' "	h. m.	feet.		
Monganui bluff	The Bluff (2,046 feet)	35 46 20	173 34 42	9 45			
Hokianga river	Flag-staff at entrance	35 32 5	173 22 55	9 45	10	springs	
" "	Upper Mission station	35 21 50	173 33 20	9 58			
Wangape	North head	35 22 20	173 13 45	9 10			
Herekino	South point	35 18 10	173 11 5	9 0			
Reef Point	Extreme	35 10 30	173 5 30	8 45			
<b>MIDDLE ISLAND.</b>							
Cape Campbell	Extreme of cape	41 43 15	174 18 30	6 0			
Waipapa point	Extreme	42 10 15	173 58 30				
Kaikora peninsula	East head	42 26 30	173 44 0	5 30			
Amuri bluff	Extreme of bluff	42 34 10	173 32 30				
Waiiau-na river	Entrance	42 47 10	173 23 10				
Sail rock	Centre	42 58 15	173 14 30				
Pegasus bay	Motunau, or Table island	43 4 0	174 6 0	4 0			
" "	Double Corner (landing place)	43 8 25	172 50 0				
Port Cooper, or Victoria	Lyttelton Custom House	43 36 42	172 44 17	4 20	4 to 7½		
Pigeon bay	Settlement cove	43 40 41	172 54 8				
Banks peninsula	East head	43 46 0	173 9 0	3 45			
Akaroa harbour	Observation head	43 49 34	172 58 17	3 24	6 to 8		
Hakatere, or Ashburton river	North entrance point	44 4 50	171 49 30				
Timaru	Flag-staff, landing place	44 23 0	171 17 20				
Waihao river	Entrance	44 47 15	171 12 35				
Waitangi river	North entrance head	44 54 50	171 12 10				
Cape Wan brow	Extreme cape	45 7 0	171 1 30				
Moerangi bay	Look-out Bluff	45 16 15	170 53 50				
" "	Whaler's Home point	45 22 30	170 54 0	3 0			
Waikouaiti bay	Jones head	45 37 20	170 43 0				
Otago harbour	Tairoa head	45 46 55	170 44 58	2 50	5 to 7		
" "	Koputai bay, South point	45 49 18	170 39 10	3 80			
Cape Saunders	Extreme of cape	45 52 40	170 46 30	2 45			
Taiieri island	East point	46 3 45	170 14 40				

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.		East.		H.W. F. & C.	Rise.
<b>MIDDLE ISLAND—continued.</b>							
		°	'	°	'	h. m.	feet.
Quoin point - -	Extreme - - -	46	9 30	170	13 0		
Molyneux bay - -	Landing place - -	46	24 5	169	48 49	3 0	6 to 8
Nugget point - -	Extreme of rocks - -	46	27 15	169	51 30		
Long point - -	Extreme of cliffs (275 feet)	46	35 15	169	36 15		
Chaslands Mistake -	Extreme of point - -	46	39 0	169	21 30		
Brothers point - -	Outer islet - - -	46	40 15	169	13 35		
Slope point - -	Extreme - - -	46	41 0	169	2 30		
Ruapuke island - {	Observation bluff (N.E. } head) - - -	46	46 42	168	33 55	1 0	6 to 8
Awarua, or Bluff } harbour - - -	Point near anchorage -	46	36 17	168	21 55	1 18	6 to 8
New river ( <i>Orete</i> ) -	Bombay rock - - -	46	31 20	168	17 35	12 10	4 to 8
Centre island - -	South end - - -	46	28 40	167	52 35	12 15	
Tewaewae bay - -	Pahia point - - -	46	20 40	167	43 15		
" " - -	Mid-bay reef - - -	46	16 50	167	29 0		
" " - -	Sandhill point - - -	46	15 45	167	22 20		
Solander island - -	Summit (1,100 feet) -	46	36 0	166	55 0		
Green islets - -	Outer islet - - -	46	15 0	166	49 0		
Windsor point - -	Extreme - - -	46	12 40	166	40 0		
Preservation inlet -	Cuttle cove - - -	46	4 30	166	40 38	11 20	4 to 8
Table rock - -	Centre (20 feet high) -	46	6 10	166	31 50		
Chalky inlet - -	North port, Little island -	45	59 2	166	35 45	11 5	4 to 8
Cape Providence - -	Extreme - - -	46	1 0	166	28 30	11 15	
West cape - -	Extreme - - -	45	54 20	166	26 30		
Dusky bay, or sound	Five Fingers point -	45	44 15	166	27 45	11 15	6 to 10
" " - -	Duck cove, Observation rock	45	48 42	166	39 37	10 50	6 to 10
Breaksea island - -	North-east point - -	45	34 45	166	38 45	11 15	
Daggs sound - -	Observ' head, North arm	45	23 7	166	52 30	11 30	6 to 8
Doubtful inlet - -	Febrero point - - -	45	16 45	166	50 15		
Thompson sound - -	Deas cove - - -	45	11 43	166	58 10	11 30	6 to 8
Nancy sound - -	Heel cove, First reach -	45	11 10	167	6 10		
Caswell sound - -	Green Point islet - -	45	1 43	167	18 15		
George sound - {	Anchorage cove, on the } North shore " - - -	44	55 20	167	26 50		
Bligh sound - -	Bounty cove - - -	44	52 56	167	32 20	10 45	6 to 8
Milford sound - -	Anita bay - - -	44	35 0	167	47 10		
" " - -	Freshwater basin - -	44	40 20	167	55 41	9 15	6 to 8

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.	East.	H.W. F. & C.	Rise.		
<b>NORTH ISLAND—continued.</b>							
		° ' "	° ' "	h. m.	feet.		
Monganui bluff	The Bluff (2,046 feet)	35 46 20	173 34 42	9 45			
Hokianga river	Flag-staff at entrance	35 32 5	173 22 55	9 45	10	spring	
" " "	Upper Mission station	35 21 50	173 33 20	9 58			
Wangape	North head	35 22 20	173 13 45	9 10			
Herekino	South point	35 18 10	173 11 5	9 0			
Reef Point	Extreme	35 10 30	173 5 30	8 45			
<b>MIDDLE ISLAND.</b>							
Cape Campbell	Extreme of cape	41 43 15	174 18 30	6 0			
Waipapa point	Extreme	42 10 15	173 58 30				
Kaikora peninsula	East head	42 26 30	173 44 0	5 30			
Amuri bluff	Extreme of bluff	42 34 10	173 32 30				
Waiau-ua river	Entrance	42 47 10	173 23 10				
Sail rock	Centre	42 58 15	173 14 30				
Pegasus bay	Motunau, or Table island	43 4 0	174 6 0	4 0			
" "	Double Corner (landing place)	43 8 25	172 50 0				
Port Cooper, or Victoria	Lyttelton Custom House	43 36 42	172 44 17	4 20	4 to 7½		
Pigeon bay	Settlement cove	43 40 41	172 54 8				
Banks peninsula	East head	43 46 0	173 9 0	3 45			
Akaroa harbour	Observation head	43 49 34	172 58 17	3 24	6 to 8		
Hakatere, or Ashburton river	North entrance point	44 4 50	171 49 30				
Timaru	Flag-staff, landing place	44 23 0	171 17 20				
Waihao river	Entrance	44 47 15	171 12 35				
Waitangi river	North entrance head	44 54 50	171 12 10				
Cape Wan brow	Extreme cape	45 7 0	171 1 30				
Moerangi bay	Look-out Bluff	45 16 15	170 53 50				
" "	Whaler's Home point	45 22 30	170 54 0	3 0			
Waikouaiti bay	Jones head	45 37 20	170 43 0				
Otago harbour	Tairoa head	45 46 55	170 44 58	2 50	5 to 7		
" "	Koputai bay, South point	45 49 18	170 39 10	3 30			
Cape Saunders	Extreme of cape	45 52 40	170 46 30	2 45			
Taiieri island	East point	46 3 45	170 14 40				

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.		East.		H.W. F. & C.	Rise.
<b>MIDDLE ISLAND—continued.</b>							
		°	'	°	'	h. m.	feet.
Quoin point - -	Extreme - - -	46	9 30	170	13 0		
Molyneux bay - -	Landing place - -	46	24 5	169	48 49	3 0	6 to 8
Nugget point - -	Extreme of rocks - -	46	27 15	169	51 30		
Long point - -	Extreme of cliffs (275 feet)	46	35 15	169	36 15		
Chaslands Mistake -	Extreme of point - -	46	39 0	169	21 30		
Brothers point - -	Outer islet - - -	46	40 15	169	13 35		
Slope point - -	Extreme - - -	46	41 0	169	2 30		
Ruapuke island - {	Observation bluff (N.E. } head) - - -	46	46 42	168	33 55	1 0	6 to 8
Awarua, or Bluff } harbour - - -	Point near anchorage -	46	36 17	168	21 55	1 18	6 to 8
New river ( <i>Orete</i> ) -	Bombay rock - - -	46	31 20	168	17 35	12 10	4 to 8
Centre island - -	South end - - -	46	28 40	167	52 35	12 15	
Tewaewae bay - -	Pahia point - - -	46	20 40	167	43 15		
" " - -	Mid-bay reef - - -	46	16 50	167	29 0		
" " - -	Sandhill point - - -	46	15 45	167	22 20		
Solander island - -	Summit (1,100 feet) -	46	36 0	166	55 0		
Green islets - -	Outer islet - - -	46	15 0	166	49 0		
Windsor point - -	Extreme - - -	46	12 40	166	40 0		
Preservation inlet -	Cuttle cove - - -	46	4 30	166	40 38	11 20	4 to 8
Table rock - -	Centre (20 feet high) -	46	6 10	166	31 50		
Chalky inlet - -	North port, Little island -	45	59 2	166	35 45	11 5	4 to 8
Cape Providence - -	Extreme - - -	46	1 0	166	28 30	11 15	
West cape - -	Extreme - - -	45	54 20	166	26 30		
Dusky bay, or sound	Five Fingers point -	45	44 15	166	27 45	11 15	6 to 10
" " - -	Duck cove, Observation rock	45	43 42	166	39 37	10 50	6 to 10
Breaksea island - -	North-east point - -	45	34 45	166	38 45	11 15	
Daggs sound - -	Observ' head, North arm	45	23 7	166	52 30	11 30	6 to 8
Doubtful inlet - -	Febrero point - - -	45	16 45	166	50 15		
Thompson sound - -	Deas cove - - -	45	11 43	166	58 10	11 30	6 to 8
Nancy sound - -	Heel cove, First reach -	45	11 10	167	6 10		
Caswell sound - -	Green Point islet - -	45	1 43	167	18 15		
George sound - {	Anchorage cove, on the } North shore - - -	44	55 20	167	26 50		
Bligh sound - -	Bounty cove - - -	44	52 56	167	32 20	10 45	6 to 8
Milford sound - -	Anita bay - - -	44	35 0	167	47 10		
" " - -	Freshwater basin - -	44	40 20	167	55 41	9 15	6 to 8



Place.	Particular Spot.	Latitude.		Longitude.		Tdes.	
		South.	East.	H.W. F. & C.	Rise.		
<b>MIDDLE ISLAND—continued.</b>							
		° ' "	° ' "	h . m.	feet.		
Awarua river - -	Entrance - - -	44 18 0	168 4 0				
			by chart.				
Cascade point - -	North extreme - -	44 0 30	168 22 30				
Jackson bay - -	Huts in S.W. corner - -	43 58 35	168 37 41				
Open-Bay islets - -	S.W. islet—centre - -	43 51 40	168 53 45				
Arnott point - -	Extreme - - -	43 45 0	169 10 0				
Bruce bay - -	Anchorage - - -	43 36 0	169 37 0				
Mount cook - -	Highest peak (13,200) - -	43 36 30	170 12 10				
Okarito - -	Lagoon and river - -	43 14 0	170 11 0				
Abut head - -	Extreme - - -	43 7 0	170 17 0				
Bold head - -	Extreme - - -	42 58 0	170 41 30				
Hokitika - -	Entrance - - -	42 45 0	170 57 0				
Grey river - -	Entrance - - -	42 28 30	171 11 15				
Perpendicular point	Centre cliff - - -	42 8 0	171 19 0				
Cape Foulwind - -	Extreme - - -	41 45 30	171 34 30				
” ” - -	Three Steeples (northern)	41 43 20	171 35 15				
Buller river - -	Entrance - - -	41 46 15	171 45 0				
(Kawatiri.)							
Rocks point - -	Extreme - - -	40 58 30	172 6 15				
Wanganui inlet - -	Entrance - - -	40 34 45	172 33 0				
Cape Farewell - -	Extreme - - -	40 29 50	172 42 10	9 0		10 to 14	
Farewell spit - -	Bush end, extreme of spit	40 33 20	173 2 0				
Massacre bay - -	Tasman corner, Abel head	40 31 52	172 45 10	8 45		9 to 13	
” ” - -	Motu Pīpi river, west ent.	40 50 5	172 51 38	9 50		10 to 14	
Astrolabe road - -	Adele island, N.E. point -	40 58 55	173 5 20				
Nelson haven - -	Magazine on Boulder bank	41 15 35	173 16 58	9 50		10 to 14	
Croisilles harbour - -	Shingle point on N. shore	41 3 15	173 43 20				
Current basin - -	Sandy bay, Cross point -	40 56 20	173 52 15	10 0		5 to 12	
Stephens island - -	North end - - -	40 40 0	174 1 10				
D'Urville island - -	{ Port Hardy: East arm } { Wooding point - - }	40 46 35	173 55 0	9 55		12	
” ” - -	Beach, Rangitoto road -	40 47 50	173 58 10				
Pelorus sound - -	Sentinel rock, off entrance	40 53 5	174 9 40	9 35		7 to 11	
” ” - -	Ohingaroa bay—beach -	41 14 22	173 51 38	10 0		7 to 11	
” ” - -	Kopi bay, central head, on south side.	40 54 42	173 57 40	9 35			
Guards bay - -	Titirangi bay, cliff at head	41 1 0	174 9 30				
Cape Lambert - -	Extreme - - -	40 59 15	174 15 0				
Port Gore - -	Head of Melville cove -	41 1 55	174 12 18	9 0		6 to 8	

Place.	Particular Spot.	Latitude.		Longitude.		Tides.	
		South.		East.		H.W. F. & C.	Rise.
<b>MIDDLE ISLAND—continued.</b>							
		°	'	°	'	h. m.	feet.
Cape Jackson - -	Extreme - - -	40	59 50	174	20 0		
Queen Charlotte } sound - - - }	Motuara, South summit -	41	5 48	174	17 30	8 50	6 to 8
Tory channel - -	White rocks, Jackson's bay	41	12 45	174	18 20	8 15	6 to 8
Brothers islets - -	North islet (235 feet) -	41	6 25	174	27 15		
Wellington head - -	Summit (2,190 feet) -	41	11 15	174	23 0		
Port Underwood - -	Bell's cove, Flag point -	41	20 28	174	9 20	6 10	6 to 8
Wairau river - -	Entrance, north side -	41	30 0	174	4 50		
White bluff - -	Summit of north extreme (890 feet).	41	33 30	174	10 10		
<b>SOUTH, OR STEWART ISLAND.</b>							
Black Rock point - -	Extreme - - -	46	41 30	167	53 40		
Port William - -	Howell's house - - -	46	50 30	168	6 30	12 45	6 to 8
Patersons inlet - -	Glory cove - - -	46	58 30	168	10 50	1 10	6 to 8
Port Adventure - -	White beach, South end	47	3 52	168	11 53	12 20	6 to 8
Lords river - -	First cove within entrance	47	7 11	168	9 34	1 20	
Port Pegasus - -	Cove abreast Anchorage island.	47	11 40	167	41 47	11 50	6 to 8
S.W. cape - -	S.W. extreme, Stewarts island.	47	17 0	167	30 15	12 0	7 springs
Traps rocks - -	North reef, N.W. rock(5 ft.)	47	22 15	167	55 15		
" " - -	South reef, centre - - -	47	33 0	167	52 45	12 0	
Wedge island - -	Centre - - - - -	47	13 30	167	21 30	12 0	
Mason bay - -	North Ernest island, South cove.	46	57 9	167	42 5	11 10	6 to 8
Codfish island - -	N.W. extreme, High rocks	46	45 45	167	37 45		
<b>SNARES ISLAND.</b>							
SNARES ISLANDS - -	S.W. island - - -	48	6 43	166	28 40		

## MAGNETIC OBSERVATIONS.

Place.	Year.	Variation. East.	Dip.	Year.
<b>NORTH ISLAND.</b>				
Three Kings islands - - - -	1874	13 30	° "	
Parengarenga harbour - - - -	—	13 35		
Cape Kara Kara - - - -	—	13 40		
Wangeroa harbour - - - -	—	13 42	58 27·54	1851
Bay of islands - - - -	—	13 50		
Wangaruru harbour - - - -	—	13 53		
Wangari harbour - - - -	—	13 58		
Great Barrier island - - - -	—	14 00		
Auckland harbour - - - -	—	14 11		
Tauranga harbour - - - -	—	14 25		
Maketu - - - -	—	14 28		
Motu Hora - - - -	—	14 27		
Opotiki - - - -	—	14 23		
Cape Runaway - - - -	—	14 20		
Hicks bay - - - -	—	14 18	59 40·8	1854
Poverty bay - - - -	—	14 35		
Ahuriri, or port Napier - - - -	—	14 45		
Port Nicholson - - - -	—	15 25	64 52·0	1850
" " - - - -	—	—	65 14	1874
Mana island - - - -	—	15 20		
Kapiti island - - - -	—	15 10		
New Plymouth - - - -	—	14 50		
<b>MIDDLE ISLAND.</b>				
Port Underwood - - - -	1874	15 20	65 12	1851
Queen Charlotte sound—Motuara - - - -	—	15 15	64 48	1850
Pelorus sound - - - -	—	15 12	64 58	1853
Nelson haven - - - -	—	15 20	64 04	1850
Port Cooper, Victoria - - - -	—	15 58		
Akaroa harbour - - - -	—	16 00	66 17	1850
Otago harbour - - - -	—	16 35	68 54	1850
Bluff harbour - - - -	—	16 40		

Place.	Year.	Variation. East.	Dip.	Year.
<b>MIDDLE ISLAND—continued.</b>				
Ruapuke island - - - -	1874	16 41		
Preservation inlet - - - -	—	16 20		
Chalky inlet - - - -	—	16 18		
Dusky bay, or sound - - - -	—	16 10	69 47	1851
Thompson sound - - - -	—	16 05		
Bligh sound - - - -	—	16 00		
Milford haven - - - -	—	16 00	68 26	1851
Jackson bay - - - -	—	15 50		
Massacre bay - - - -	—	15 10		
<b>SOUTH ISLAND.</b>				
Port William - - - -	1874	16 40	70 23	1850
Port Adventure - - - -	—	16 43	70 22	1850
Port Pegasus - - - -	—	16 48	70 39	1850
Mason bay - - - -	—	16 33		
SNARES ISLANDS - - - -	—	16 55		

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